UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960
MAR 07 2014

CERTIFIED MAIL 7012 1010 0002 0759 7479
RETURN RECEIPT REQUESTED

City of Olive Branch
Attn: Mr. Steven Bigelow, P.E.
Director of Public Works
10175 Highway 178
Olive Branch, Mississippi 38654

Re: U.S. Environmental Protection Agency and Mississippi Department of Environmental Quality Compliance Evaluation Inspection Information Request
Section 308 of the Clean Water Act
City of Olive Branch Wastewater Collection & Transmission System

Dear Mr. Bigelow:

On June 12, 2013, the U.S. Environmental Protection Agency Region 4 and the Mississippi Department of Environmental Quality (MDEQ) conducted a Compliance Evaluation Inspection (CEI) of the City of Olive Branch, Mississippi's (Olive Branch) Wastewater Collection and Transmission System (WCTS). The objective of this CEI was to assess Olive Branch's compliance with the Clean Water Act (CWA). Additionally, the EPA evaluated Olive Branch's Management, Operations and Maintenance programs related to its WCTS. The inspection results are summarized in the enclosed CEI report.

Pursuant to Section 308 of the CWA, 33 U.S.C. § 1318, the EPA hereby requests Olive Branch to respond to the enclosed CEI report and Enclosure A, within 30 days of its receipt of this letter. The response should be directed to:

Mr. Brad Ammons, Enforcement Officer
U.S. Environmental Protection Agency, Region 4
Clean Water Enforcement Branch
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

All information submitted must be accompanied by the following certification signed by a responsible City official in accordance with 40 C.F.R. § 122.22:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Failure to comply with this information request may result in enforcement proceedings under Section 309 of the CWA, 33 U.S.C. § 1319, which could result in the judicial imposition of civil or criminal penalties or the administrative imposition of civil penalties. In addition, there is potential criminal liability for the falsification of any response to the requested information.

Olive Branch shall preserve, until further notice, all records (either written or electronic), which exist at the time of receipt of this letter that relate to any of the matters set forth in this letter. The term "records" shall be interpreted in the broadest sense to include information of every sort. The response to this information request shall include assurance that these record protection provisions were put in place, as required. No such records shall be disposed of until written authorization is received from the Chief of the Clean Water Enforcement Branch at the U.S. EPA, Region 4.

If you believe that any of the requested information constitutes confidential business information, you may assert a confidentiality claim with respect to such information except for effluent data. Further details, including how to make a business confidentiality claim, are found in Enclosure B.

Please contact Mr. Brad Ammons at (404) 562-9769 or via email at ammons.brad@epa.gov, if you have any questions or concerns regarding this matter.

Sincerely,

Mary Davis

for Denisse D. Diaz, Chief
Clean Water Enforcement Branch
Water Protection Division

Enclosures

cc: Mr. Chris Sanders
Mississippi Department of Environmental Quality

Mr. Jim Harvey
Mississippi Department of Environmental Quality

ENCLOSURE A

SSO PROGRAM
The City of Olive Branch, MS

1. Provide the following:

a. The size of the City's Sanitary Sewer Collection System (SSS) (linear feet or miles);
b. A list of the pump stations in the SSS, including size (gpm), and indicate if back up power is available and if it is adequate to fully operate the pump station;
c. A list of all constructed overflow points (any unpermitted constructed discharge points) in the SSS (including pump stations) prior to the headworks of the receiving WWTP; and
d. The population served by the City's SSS.

2. For purposes of this Information Request, a sanitary sewer overflow (SSO) is an overflow, spill, release, or diversion of wastewater from the SSS. SSOs include overflows or releases of wastewater that reach waters of the United States (U.S.); overflows or releases of wastewater that do not reach waters of the U.S.; and wastewater backups into buildings that are caused by blockages or flow conditions in a sanitary sewer other than a building lateral. Wastewater backups into buildings caused by a blockage or other malfunction of a building lateral that is privately owned is not an SSO.

Provide a listing of all SSOs that occurred from January 2009 to the present. For each SSO provide the following:

a. Date(s) of the SSO;
b. Time (and Date if other than a. above) when the City was notified that the SSO event occurred;
c. Time (and Date if other than a. above) when the City (or contractor) crew responded to the SSO;
d. Time (and Date if other than a. above) when the SSO ceased;
e. Time (and Date if other than a. above) when corrective action was completed;
f. Location of the SSO, including source (pump station, manhole, etc.);
g. Ultimate destination of the SSO, such as surface waterbody (by name, if available), storm drain leading to surface waterbody (by name, if available), dry land, building, etc.;
h. Volume of the SSO;
i. Cause of the SSO such as grease, roots, other blockages, wet weather (infiltration and inflow), loss of power at pump station, pump failure, etc.;
j. Corrective actions taken to stop the SSO; and
k. Corrective actions taken to prevent this or similar SSOs in the future.

If available, please provide the above information in a Microsoft compatible spreadsheet format.

3. If the City has a formal written plan for responding to, addressing, and reporting SSOs (i.e., a Sewer Overflow Response Plan ("SORP")), provide a copy of the plan.

4. Provide a copy of any additional City procedures not included in the SORP (as referenced in Question 3 above) for the following activities:

   a. Documenting SSOs;
   b. Estimating SSO volume;
   c. Identifying root causes of SSOs;
   d. Containment and clean-up of SSOs, including any specific procedures addressing backups into buildings caused by mainline problems;
   e. Identifying wet weather related SSOs and reconnaissance of these during rain events; and
   f. All reporting of SSOs to the permitting authority, the State of Mississippi.

5. Provide the name of the person (or position title) responsible for each of the activities indentified in the City's SORP and/or listed in Question 4 above.

ENCLOSURE B

RIGHT TO ASSERT BUSINESS CONFIDENTIALITY CLAIMS
(40 C.F.R. Part 2)

Except for effluent data, you may, if you desire, assert a business confidentiality claim as to any or all of the information that EPA is requesting from you. The EPA regulation relating to business confidentiality claims is found at 40 C.F.R. Part 2.

If you assert such a claim for the requested information, EPA will only disclose the information to the extent and under the procedures set out in the cited regulations. If no business confidentiality claim accompanies the information, EPA may make the information available to the public without any further notice to you.

40 C.F.R. §2.203(b). **Method and time of asserting business confidentiality claim.** A business which is submitting information to EPA may assert a business confidentiality claim covering the information by placing on (or attaching to) the information, at the time it is submitted to EPA, a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as "trade secret," "proprietary," or "company confidential." Allegedly confidential portions of otherwise non-confidential documents should be clearly identified by the business, and may be submitted separately to facilitate identification and handling by EPA. If the business desires confidential treatment only until a certain date or until the occurrence of a certain event, the notice should so state.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 4
Water Protection Division
Clean Water Enforcement Branch

COMPLIANCE EVALUATION INSPECTION REPORT

City of Olive Branch, Mississippi
Olive Branch, Mississippi
Satellite to Desoto County Regional Utility Authority

Facility Address:
10175 Highway 178
Olive Branch, Mississippi 38654

Inspection Date:
June 12, 2013

Inspectors:
Brad Ammons, Environmental Engineer, EPA Region 4
Jim Harvey, Mississippi Department of Environmental Quality

Inspection Report Prepared by:
Brad Ammons

January 23, 2014

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

CCTV	Closed Circuit Television
CEI	Compliance Evaluation Inspection
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
GIS	Geographic Information System
I/I	Infiltration and Inflow
MDEQ	Mississippi Department of Environmental Quality
MOM	Management, Operation, and Maintenance
NPDES	National Pollutant Discharge Elimination System
SCADA	Supervisory Control and Data Acquisition
SORP	Sewer Overflow Response Plan
SSO	Sanitary Sewer Overflow
SUO	Sewer Use Ordinance
WCTS	Wastewater Collection and Transmission System
WWTP	Wastewater Treatment Plant

I. OVERVIEW

The City of Olive Branch, Mississippi (Olive Branch), through its Public Works Department, provides sanitary sewer services for residential, commercial and industrial entities within the City of Olive Branch, Mississippi. Regarding sanitary sewer services, Olive Branch is responsible for the operation and maintenance of approximately 300 miles of sewer lines, approximately 76 sanitary sewer pump stations, and other sanitary sewer related facilities. Most of Olive Branch's wastewater is transferred to the Desoto County Regional Utility Authority (DCRUA) for treatment and discharge at DCRUA's Short Fork Wastewater Treatment Plant (WWTP) (a.k.a. Ross Road WWTP). Olive Branch has experienced tremendous growth between 1990 and 2010, and was named the fastest growing city in the United States in a Business Week news article[1]. The population of Olive Branch in 1990 was 3,567. The City grew to 21,054 by the 2000 Census and to 33,484 by the 2010 Census.

The Mississippi Department of Environmental Quality (MDEQ) is authorized under the Clean Water Act (CWA) to implement the National Pollutant Discharge Elimination System (NPDES) program in Mississippi. As Olive Branch owns and operates the sanitary sewers that ultimately discharge to DCRUA's Short Fork WWTP and does not own the WWTP itself, Olive Branch has not been issued a NPDES permit and is considered a satellite of DCRUA. MDEQ has not issued any formal enforcement actions against Olive Branch related to any of its sewer related facilities.

On April 12, 2013, the EPA received a complaint, including photographs, of a Sanitary Sewer Overflow (SSO) that reached waters of the United States from a citizen living in Olive Branch. The same citizen submitted video to EPA for another SSO that reached waters of the United States on May 2, 2013. EPA forwarded both complaints to MDEQ.

Subsequently, EPA conducted a compliance evaluation inspection (CEI) of Olive Branch's Wastewater Collection and Transmission System (WCTS) on June 12, 2013. The purpose of this CEI was to evaluate compliance with the CWA as it relates to SSOs from Olive Branch's WCTS that reach waters of the United States. Additionally, the purpose of this compliance inspection was to examine the causes and potential corrective actions for SSOs from the sewer system to waters of the United States.

During the June 12, 2013 CEI, EPA and MDEQ visited the customer complaint site, as well as one (1) sewer pump station. Below are the specific facilities inspected during the June 12, 2013 CEI.

Customer complaint site

- 7134 Crape Myrtle Drive

Pump Stations

- Hampton Inn Pump Station

[1] http://www.businessweek.com/lifestyle/content/apr2011/bw20110426_893708.htm

This report describes EPA's findings, provides an initial analysis of SSOs from the sewer system to waters of the United States, and provides EPA's review of Olive Branch's *Preventative Maintenance Sewer Manual* (April 2013), a copy of which was provided to EPA during this CEI. In this report, EPA also identifies areas that need to be addressed and presents preliminary recommendations.

II. OBJECTIVES

The specific objective of this WCTS CEI was to assess Olive Branch's compliance with the CWA. Additionally, EPA examined the causes of SSOs from Olive Branch's WCTS.

III. INVESTIGATION METHODS

The investigation of Olive Branch included:

- Interviews with Olive Branch personnel.
- Review of Olive Branch's records/documents.
- Review of online sources of information.
- Visual inspection of SSO locations in the sewer system and a pump station.

Most of the EPA's questions were answered by interviewing Mr. Steven Bigelow, P.E., the City's Public Works and Engineering Department Director. Field inspections by EPA and MDEQ were accompanied by Mr. Bigelow and/or by Mr. Larry McClure (Water and Wastewater Superintendent) and Mr. Lanny May (Water and Wastewater Supervisor).

IV. REGULATORY SUMMARY

Olive Branch is not authorized to discharge pollutants to a water of the United States by a NPDES permit. Most of Olive Branch's SSOs have discharged to Camp Creek and/or its tributaries. Camp Creek and its tributaries have not been listed in the 2008, 2010 or 2012 §303(d) list of impaired waters. Camp Creek is a tributary of the Coldwater River. MDEQ has not issued any formal enforcement for Olive Branch's SSOs.

V. INSPECTION SUMMARY AND FINDINGS

EPA conducted a CEI of Olive Branch's WCTS on June 12, 2013 to evaluate compliance with the CWA.

A. Analysis of SSOs

Discharges from municipal sanitary sewer systems to waters of the United States are prohibited, unless authorized by an NPDES permit. According to Olive Branch personnel, Olive Branch identifies SSO events typically by customer complaints. Mr. Bigelow provided EPA with a 3 month printout of work orders for sewer complaints (April – June 10, 2013). It appears that during this 3 month period, Olive Branch experienced 32 SSOs that potentially reached waters of the United States. There were no

SSO volumes or SSO causes reported or recorded in the City's work order system printout.

Mr. Bigelow told EPA that the City had no constructed overflow structures in the WCTS. The City does have a written Management, Operations and Maintenance (MOM) Program, entitled *Preventative Maintenance Sewer Manual* (April 2013). According to the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch experienced 50 SSOs that directly entered waters of the United States from January 2009 – April 2013. The above listed 32 SSOs from the Work Order system are in addition to the 50 SSOs listed as directly entering waters of the United States in the *Preventative Maintenance Sewer Manual* (April 2013).

Finding: Olive Branch has not reported all of its SSOs to MDEQ.

Recommendation: Olive Branch should develop a written Sewer Overflow Response Plan (SORP) to ensure that Olive Branch has proper SSO notification, reporting and recordkeeping procedures.

Finding: While the City's work order system does not record the cause of the SSO or sewer backup, Olive Branch staff told EPA and MDEQ that the main cause of SSOs in their WCTS was Fats, Oils and Grease (FOG) or other debris causing blockages in the gravity sewers. The City has planned to implement a routine cleaning schedule of cleaning approximately 20% of the entire WCTS on an annual basis (i.e. a 5-year schedule). Certain sewers, identified as trouble spots or critical service areas will be cleaned on a more frequent basis.

However, many municipal utilities attribute SSOs to FOG or grease, when the true cause of the blockage is different. For example, grease may not block a sewer unless there are roots, offset joints and/or other sewer defects that cause the grease to accumulate. In fact, the cause of the most recent SSOs (outlined in City's *Preventative Maintenance Sewer Manual*) were attributed to wet weather flows overwhelming the Hampton Inn pump station. However, the City's staff now believes that SSOs in the Alexander Crossing subdivision may be caused by undersized sewers in the subdivision and the City has plans to install a parallel relief sewer. In addition, staff told EPA that there is a wet weather capacity problem in the Craft Road area, which is where Olive Branch's WCTS connects to the DCRUA system.

Recommendations: (1) Olive Branch should immediately implement the City's Priority Cleaning and Routine Cleaning programs for gravity sewers (outlined in the City's *Preventative Maintenance Sewer Manual* (April 2013), including the necessary funding and additional staff; (2) Olive Branch should review, evaluate and revise its FOG Control Program to prevent the entry of FOG into the WCTS and enforce against violators, including a review of the City's FOG limit of 150 ppm of FOG (many sewer utilities use the limit of 100 ppm); (3) Olive Branch should have a standard procedure for investigating the underlying causes of the SSOs more thoroughly, and (4) Olive Branch should develop and implement a Sanitary Sewer Evaluation System (SSES) and

Rehabilitation Program, including implementing sewer rehabilitation and/or upgrade plans to eliminate wet weather SSOs in the Alexander Crossing subdivision and the Craft Road area.

Finding: Olive Branch only has 4 of its 76 sewer pump stations on Supervisory Control and Data Acquisition (SCADA) and only 1 pump station has on-site backup power (the Hampton Inn pump station). In addition, Olive Branch employees told EPA and MDEQ that the Water/Sewer department no longer has a portable generator and only has 3 portable bypass pumps (1-6" bypass pump + 2-3" bypass pumps).

Recommendations: Olive Branch should consider installing SCADA systems on the Pump Stations it owns and operates. Olive Branch should install on-site alarms (visual and/or audible) at all of the pump stations it owns and operates. Finally, Olive Branch should either install on-site generators and/or purchase portable generator(s) that are dedicated to the Water/Sewer Department and are large enough to power the City's largest pump stations in case of power outages.

B. Capacity, Management, Operation, and Maintenance Programs

EPA assessed several of Olive Branch's CMOM programs through this inspection. The following sections will discuss and provide recommendations for several MOM programs.

1. Continuous Sewer System Assessment Program

a. Prioritization

This was not specifically discussed during the inspection. However, the City's *Preventative Maintenance Sewer Manual* does provide a prioritization protocol for sewer areas for inspection/assessment as being based upon the older parts of the City and known problem areas.

Recommendations: Olive Branch should continue to implement the City's sewer WCTS prioritization program to prioritize its sewer inspection/assessment activities. In addition, Olive Branch should consider conducting a flow monitoring study to further prioritize areas for assessment.

b. Corrosion Defect Identification

Olive Branch has not historically experienced SSOs due to corrosion, especially given that most of the WCTS has been constructed of PVC over the last 2 decades. However, the City should take corrosion into account in sewer rehabilitation and/or upgrade plans.

Recommendations: Olive Branch should identify any major sewer line that may be subject to corrosion and develop a program that includes procedures for

corrosion identification, corrosion identification forms, performance goals, corrosion defect analysis, and a mechanism to collect this data.

c. Manhole Inspection

While this was not discussed specifically during the inspection, the City's *Preventative Maintenance Sewer Manual* outlines a plan to inspect approximately 20% of the manholes in a year (i.e. a 5 year cycle to inspect all of the City's manholes).

Recommendations: Olive Branch should continue to implement the manhole inspection program to routinely inspect manholes within the entire WCTS. The program should include standard manhole inspection procedures, inspection forms, performance goals, manhole defect analysis, and a mechanism for collecting this data.

d. Gravity Sewer Line Inspection

Olive Branch has a plan to inspect and/or assess the gravity sewers in its WCTS (see above regarding plans outlined in the City's *Preventative Maintenance Sewer Manual* (April 2013)) on a 5 year cycle.

Recommendations: Olive Branch should continue to implement its program to routinely inspect and/or assess gravity sewer lines as part of the recommended SSES and rehabilitation program. This program should use industry-standard methods of inspection (e.g. Closed-Circuit Television of gravity sewer lines, dyed water flooding, smoke testing, etc.). Finally, this inspection program should also inspect sewer laterals and include the City's consideration of updating its sewer use ordinance to include mandatory rehabilitation of privately-owned laterals, as outlined in the City's *Preventative Maintenance Sewer Manual* (April 2013).

e. Flow Monitoring

Olive Branch does not have any flow meters in its WCTS. According to Mr. Bigelow, there are two locations in the WCTS that have wet weather capacity limitations: (1) the Alexander Crossing subdivision area (Southern Gum Way + Crape Myrtle Drive) and (2) the Craft Road area. Olive Branch does have 1 rain gauge that is centrally located within the City.

Recommendations: Olive Branch should develop a flow monitoring program to support engineering analyses related to sewer system capacity and peak wet-weather flow evaluations. This program would help in understanding the causes of and finding possible locations of SSOs, and help in the development of a sewer model. The program may include the use of an appropriate number of calibrated permanent or temporary flow meters during specific sewer system assessment

activities. The program should also include adequate rainfall measurement and mechanisms to collect the flow monitoring information.

f. Gravity System Defect Analysis

Olive Branch appears to have a plan to begin conducting defect analysis on the WCTS, as outlined in its *Preventative Maintenance Sewer Manual* (April 2013).

Recommendations: Olive Branch should implement its program that analyzes gravity sewer system defects using industry standard defect codes (available from different sources), written defect identification procedures and guidelines, a standardized process for cataloging gravity system defects, and mechanisms to collect and save this data for further analysis.

g. Pump Station Performance and Adequacy

According to Mr. Bigelow, there are two crews that check pump stations. These crews drive by each pump station daily (Monday-Friday) and do a more detailed check on each station once a month. According to Mr. May, these crews inspect the pumps (to ensure the pumps work), record run times and check alarms on the daily inspections. The first line supervisor checks these daily records, but in a few instances in the records reviewed, EPA and MDEQ noted that 1 pump is running a lot longer than other pumps and/or the field crews write down maintenance needs that are not quickly resolved.

Recommendations: Olive Branch should implement a more formal program that evaluates pump station performance and adequacy based upon the daily inspections. The program should include trend analysis of pump run-times, pump start counters, historical review of causes for pump failures or SSOs, and mechanisms to collect and analyze this data. Olive Branch should specifically consider installing SCADA systems on its pump stations. Olive Branch should use this data to evaluate if pump stations are adequate to handle flows, and identify performance problems.

2. Infrastructure Rehabilitation Program

According to the *Preventative Maintenance Sewer Manual* (April 2013), in the last 10 years, Olive Branch has used Corps of Engineers (592 Funding) for 75% of any sewer capital improvements while the City's share was 25%. Most of the City's share of monies came from the sale of the Ross Road and the Brayborne WWTPs to the DCRUA (approximately $4,000,000, of which approximately $450,000 remains in reserve). Also, in the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch mentions the following rehabilitation needs:

- Additional rehabilitation past the Phase I and II rehabilitation of the older parts of the City;
- Replacement of an estimated $1.1 million in gravity sewer lines, including a

10" sewer that services the Magnolia Lakes neighborhood; installing a parallel 15" sewer for commercial development (Hacks Cross Road); and upgrading a 15" sewer that runs from the Ross Road WWTP to Highway 178 to an 18" sewer.

Recommendations: Olive Branch should conduct a SSES and Rehabilitation Program in the two wet-weather capacity limited areas of the WCTS (i.e. Alexander Crossing subdivision + Craft Road area). As the Craft Road area is the connection point to the DCRUA system, Olive Branch should work with DCRUA to look into ways to resolve the capacity issue there.

Specifically, the SSES should evaluate all gravity sewer line defects, manhole defects, pump station defects, force main defects and siphon defects. Finally, a post-rehabilitation inspection program should be developed and implemented in order to review the effectiveness of the rehabilitation program.

3. System Capacity Assurance Program

a. Capacity Assurance for New Connections, and
b. Protocols for Capacity Assurance

Olive Branch does not have a formal, written WCTS capacity assurance program. As mentioned above, Olive Branch employees identified to the 2 following wet-weather capacity limited areas in the City's WCTS:

- Alexander Crossing subdivision
- Craft Road (Olive Branch's connection to DCRUA).

However, in the *Preventative Maintenance Sewer Manual* (April 2013), the City states that it has developed and calibrated a hydraulic model for any capacity issues.

Recommendations: Olive Branch should develop and implement a formal program to ensure that there is adequate capacity to collect, transmit, and treat additional sewage expected as a result of prospective new sewer connections. Olive Branch should develop standardized design flow rules of thumb (i.e., regarding pipe roughness, manhole head losses, accuracy of distance and slope on as-built drawings, and water use). Additionally, Olive Branch should clarify if the hydraulic model is of the entire sewer system or just known capacity limited areas. Olive Branch should use flow metering to confirm mathematical estimations of existing peak flow. The program should also require the certification of adequate capacity by a registered Professional Engineer.

4. Sewer Mapping and System Inventory Program

Olive Branch has the WCTS assets in a geographic information system (GIS).

Recommendations: Olive Branch should continue to use its GIS and Information Management System (IMS; discussed below) to further refine the O&M and Rehabilitation needs of the WCTS.

5. Information Management System

According to the *Preventative Maintenance Sewer Manual* (April 2013), if a complaint is received during normal work hours (i.e. 7am - 5pm, Monday – Friday), the information is entered immediately into the City's MUNIS database/IMS, a work order is created and a response crew is dispatched. If a complaint is received after hours, the Olive Branch Police Department takes the call, the on-call crew is called for response and the complaint and resolution of the complaint is not entered into the database until the next business day. All work orders and their resolution are tracked in the MUNIS database/IMS.

Recommendation: Olive Branch should continue to use its database to shift resources from a reactive maintenance approach to a preventive and eventually, a predictive maintenance approach. The database should be used to prioritize sewer inspection/assessment activities, as well.

6. Financial Analysis Program
   a. Operations & Maintenance Budget Program
   b. Capital Improvement Budget Program, and
   c. Customer Rate Setting Analysis Program

The annual budget is completed by September 15th to comply with the City budget cycle. According to the *Preventative Maintenance Sewer Manual* (April 2013), the O&M budget starts with the previous year's costs and adds the projected needs for the coming year. The Public Works Department has a 3 year Capital Improvement Project (CIP) planning horizon for known WCTS needs. Expenses covered by the sewer user charges include: (1) O&M expenses; (2) capital reserve fund replenishment (currently at $450,000); and (3) debt service. The Department has requested sewer rate increases to move to more Preventive Maintenance (rate increase needed in 2014), as well as currently known CIPs. The Department expects that the CIP needs will grow as it assesses the WCTS by CCTV as well.

Recommendations: Given the size of the known needed CIPs, as well as the anticipated increased O&M costs, Olive Branch should more formally document this process.

7. Equipment, Tools & Inventory Management Program

Olive Branch does not have a dedicated portable generator to power any sewer pump stations. In addition, several items listed in the *Preventative Maintenance*

Sewer Manual (April 2013) are nearing the end of their useful life (e.g. the smoke tester & blower; the 3 inch bypass pump; the 6 inch bypass pump and the crane truck).

Recommendations: Olive Branch should develop and implement a more formal Equipment, Tools and Inventory Management Program. Specifically, this program should address equipment; tools and other items (e.g. spare pipe or pump parts) needed to address SSOs due to power outages, pump failures (mechanical), and line breaks.

8. Customer Service Programs

a. Customer Complaints

As discussed above, Olive Branch has a customer complaint phone number for normal business hours and uses the Olive Branch Police Department for after-hours complaint calls.

Recommendation: Olive Branch should use the complaint MUNIS database to inform the public of rehabilitation needs and prioritize WCTS assessment and rehabilitation work.

b. Public Education Program

Olive Branch's Fats, Oils and Grease (FOG) compliance/enforcement program is run by the City's Pretreatment Program. In the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch states that it uses several information and public education programs, including sewer system assessment work, major repairs or rehabilitation, FOG handling information, a grease disposal pamphlet, complaint procedures and other items.

Recommendations: None.

9. Legal Support Programs

a. Inter-Jurisdictional Agreement Program

Olive Branch is a satellite to DCRUA and has a contract with DCRUA for treatment of Olive Branch's wastewater.

b. Ordinance Program

In the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch noted a few items of concern to EPA. Specifically, the higher limit in the sewer use ordinance for FOG of 150 ppm (many utilities use 100 ppm) and the City's recognition that it does not have legal authority over private laterals that may

cause excessive I/I. EPA used the online version of the City's sewer use ordinance (SUO) and other ordinances found at www.municode.com.

Recommendation: Olive Branch should review, evaluate and revise its ordinances and/or Inter-Jurisdictional agreement(s) with DCRUA for items such as FOG control, sewer design criteria, authority over private laterals that cause excessive I/I, and pretreatment limitations and requirements.

c. Pretreatment Legal Support Program

The State of Mississippi is the Control Authority for purposes of the pretreatment program.

d. Grease Control Legal Support Program

The City's online Sewer Use Ordinance (SUO) outlines a limit of 150 mg/L for fats, wax, grease & oil (Chapter 42, Article VII., Division 2., Subdivision V, Section 42-364 of Olive Branch's online ordinances), as well as the requirement of a grease interceptor for certain sewer use customers when determined necessary by the City Engineer (Chapter 42, Article VII., Division 2., Subdivision V, Section 42-367 of Olive Branch's online ordinances). According to Chapter 14, Article II., Section 14-26 of Olive Branch's online ordinances, the City has adopted the International Plumbing Code, 2009 edition, as its plumbing code (effective May 1, 2011). Finally, the SUO outlines penalties for violations of the SUO (Chapter 42, Article III., Division 1, Section 42-67 and Section 42-79 of Olive Branch's online ordinances) allows for discontinuation of service (drinking water) for late payments and for failure to protect or maintain service lines.

e. Service Laterals Legal Support Program

As noted above, it appears that Olive Branch has the authority to discontinue water service for failure to protect or maintain service lines. The only prohibition of connecting inflow sources appears to be during the construction of a new building (i.e. it is covered under the Building Code). In the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch stated that it is "...also considering adding a requirement that service lateral condition be evaluated as part of a home sale."

Recommendation: Olive Branch should review, evaluate and revise its SUO to address leaky or defective sewer service laterals (infiltration) and Olive Branch's authority in requiring remediation of defective private service laterals.

f. Septic Tank Haulers Legal Support Program

EPA did not specifically ask about this Program during its inspection. EPA did not find any requirements for hauled waste (e.g. require a waste hauler permit;

getting approval to dump wastes; outlining specific locations to dump wastes, etc.) in Olive Branch's online ordinances.

Recommendation: Olive Branch should address septic tank haulers and other wastes hauled for disposal in its sewer use ordinance.

g. "Call Before You Dig" Legal Support Program
EPA did not specifically ask about this Program during its inspection. However, EPA notes that the Olive Branch "One Call" phone number is prominent on the City's website.

Recommendations: Olive Branch should review, evaluate and revise, as necessary, its "Call Before You Dig" Legal Support Program.

10. Water Quality Monitoring

a. Impact Monitoring Program

Olive Branch does not take or analyze water quality samples to assess impacts on waters of the United States after an SSO event.

Recommendations: Olive Branch should establish a specific threshold on when to assess the impact of pollution due to a specific SSO from the sewer system. This program should also include mechanisms to collect the data and transmit the information to the regulatory agency (MDEQ). Additionally, it should include established sampling parameters, standard sampling procedures, and quality assurance/quality control procedures.

11. Pump Station Operation Program

According to the *Preventative Maintenance Sewer Manual* (April 2013), the City checks the 76 pump stations daily (Monday – Friday) by 2 pump station crews. This was evidenced by daily log sheets that are handed in to the Water & Sewer Supervisor (Mr. Lanny May), which shows that the crews record run times and check to ensure pumps are operational.

However, given that Olive Branch does not have a dedicated portable generator and only 1 pump station has on-site backup power, Olive Branch may not be able to react quickly enough in instances of electrical failures to prevent SSOs, including unpermitted discharges. For mechanical failures, it was not clear if Olive Branch's larger bypass pump (6" bypass pump) was large enough to pump around the City's larger pump stations in case of electrical or mechanical failures.

Recommendations: Olive Branch should develop and implement a formal, written Pump Station Operation Program (PSOP) that includes additional equipment needed to react to either mechanical or electrical failures at its pump stations. The PSOP

should address either purchasing of on-site electrical generators or portable generators large enough to power Olive Branch's largest pump stations dedicated to the Water/Sewer Department. In addition, Olive Branch should confirm the capacity of its bypass pumps to ensure they are large enough to pump flows expected at its largest pump stations in the case of mechanical failures.

12. Corrosion Control Program

According to the *Preventative Maintenance Sewer Manual* (April 2013), the vast majority of the gravity sewer lines are constructed of PVC. Thus, corrosion of the gravity sewer lines will not likely be an issue.

Recommendations: None.

13. Fats, Oils, and Grease Control Program

According to the *Preventative Maintenance Sewer Manual* (April 2013), all of the commercial sources of FOG are regulated by the City and/or the County Health Department. In addition, Olive Branch conducts public education and outreach related to FOG handling and disposal.

Recommendations: FOG can and has caused blockages in Olive Branch's WCTS. Additionally, FOG could increase operation and maintenance work due to increased blockages and sewer cleaning requirements. Olive Branch should review, update, revise and continue to implement its FOG Ordinance, as well as continue with public education and outreach about the true costs of dealing with FOG.

In addition, many municipal utilities attribute SSOs to grease, when the true cause of the blockage is different. For example, grease may not block a sewer unless there are roots, offset joints and/or other sewer defects that cause the grease to accumulate. Therefore, Olive Branch should continue its sewer system cleaning, inspection and assessment program to investigate the underlying causes of the SSOs more thoroughly.

14. Pump Station Preventive Maintenance Program

According to the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch has certain preventive maintenance activities for each station that occur on monthly (exercise generators) or annual (pump down the wet well, remove grease buildup and calibrate the floats) schedules. In addition, the City uses the MUNIS system to schedule weekly, semi-annual and annual preventive maintenance activities for mechanical and electrical maintenance.

Recommendation: Olive Branch should continue to implement the preventive maintenance activities it is conducting.

15. Force Main Preventive Maintenance Program

According to the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch inspects and maintains the 105 air release valves on a semi-annual basis. In addition, if the backpressure is more than 25% greater than the expected operating head, the force main will be cleaned.

Recommendation: Given the lack of SSOs due to force mains, Olive Branch should continue to implement its force main preventive maintenance program as described.

16. Gravity Line Preventative Maintenance Program
    a. Routine Hydraulic Cleaning Program and
    b. Routine Mechanical Cleaning Program

As described in the *Preventative Maintenance Sewer Manual* (April 2013), Olive Branch's Cleaning, Inspection and Assessment program should continue to drive down the number of blockage related SSOs and place the City in a preventive maintenance frame of action. However, EPA noted that Olive Branch stated it would be necessary to hire another 2-man crew to meet the goal of cleaning the entire system on a 5-year cycle (i.e. 20% of the system per year).

Recommendations: Olive Branch should budget for the needed crew and equipment to continue to move toward a complete preventive maintenance system.

    c. Root Control Program

Olive Branch has a mechanical root cutter, which is used in sewer lines with known chronic root problems. Those lines are then placed on a list to return and do mechanical cleaning every 1-2 years. Olive Branch is investigating chemical root control as well.

Recommendations: Olive Branch should continue to refine this program. Specifically, EPA does not favor chemical root control, so known problem spots may need to be assessed for repair or rehabilitation.

17. Emergency Response Plan for Sewer System

This was not discussed specifically during the inspection and there is no discussion of it in Olive Branch's *Preventative Maintenance Sewer Manual* (April 2013).

Recommendations: Olive Branch should develop and implement a formal, written Sewer System Emergency Response Plan (a.k.a. Contingency Plan). Specifically, the ERP should address such items as Public Notification, Regulatory Agency Notification, an Emergency Flow Control Program, an Emergency O&M Plan, and

finally, Preparedness Training.

VI. ATTACHMENTS

A. Inspection Photos
B. Attendance Lists

ATTACHMENT A: Inspection Photos

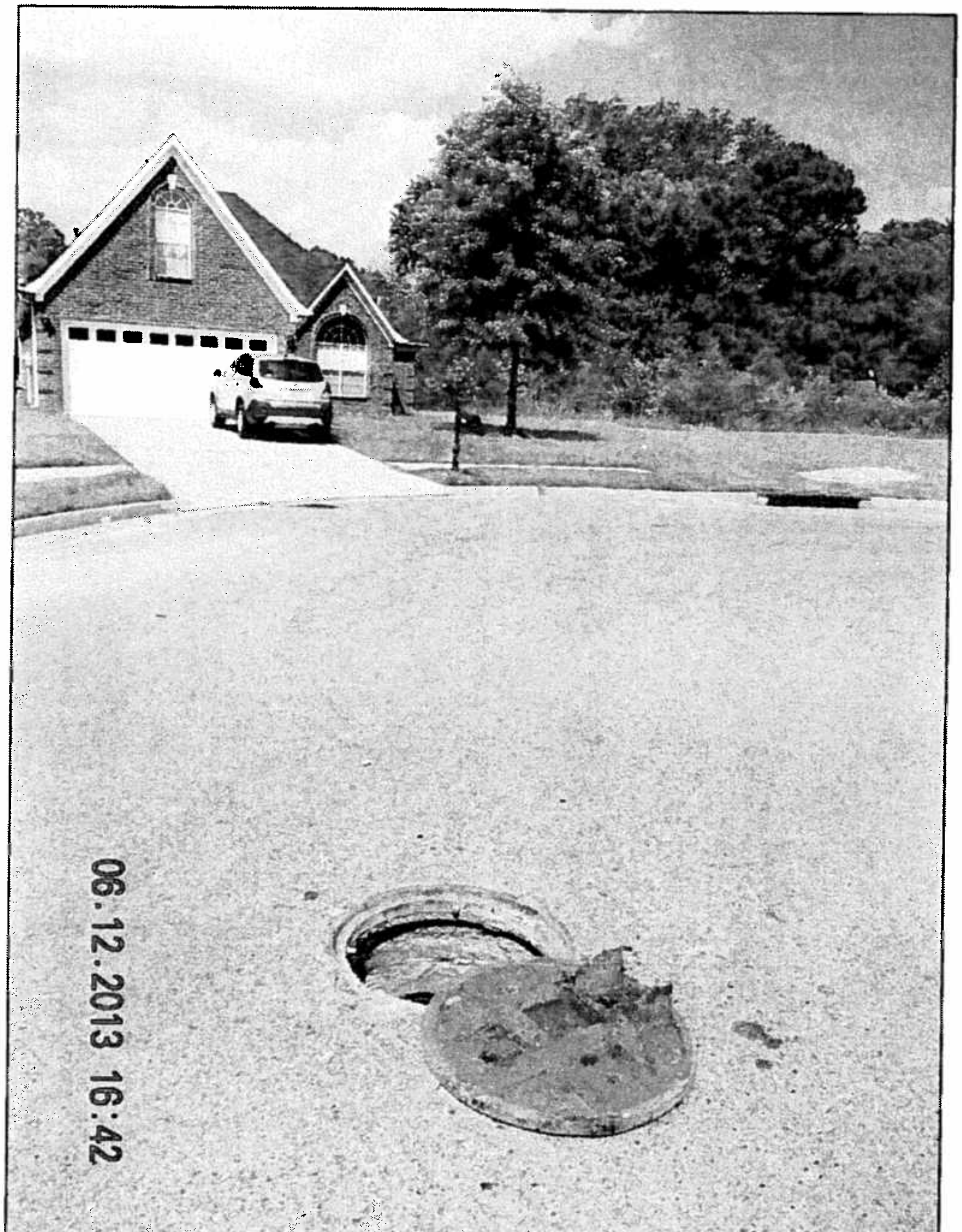


Figure 1. Manhole outside of 7134 Crape Myrtle Dr. (home in background). Note curb/gutter storm drain to the right of driveway.

Figure 2. Second manhole in front of 7134 Crape Myrtle Drive (according to City staff, this is the manhole that overflows first during wet weather). Curb/gutter storm drain is directly behind photographer.

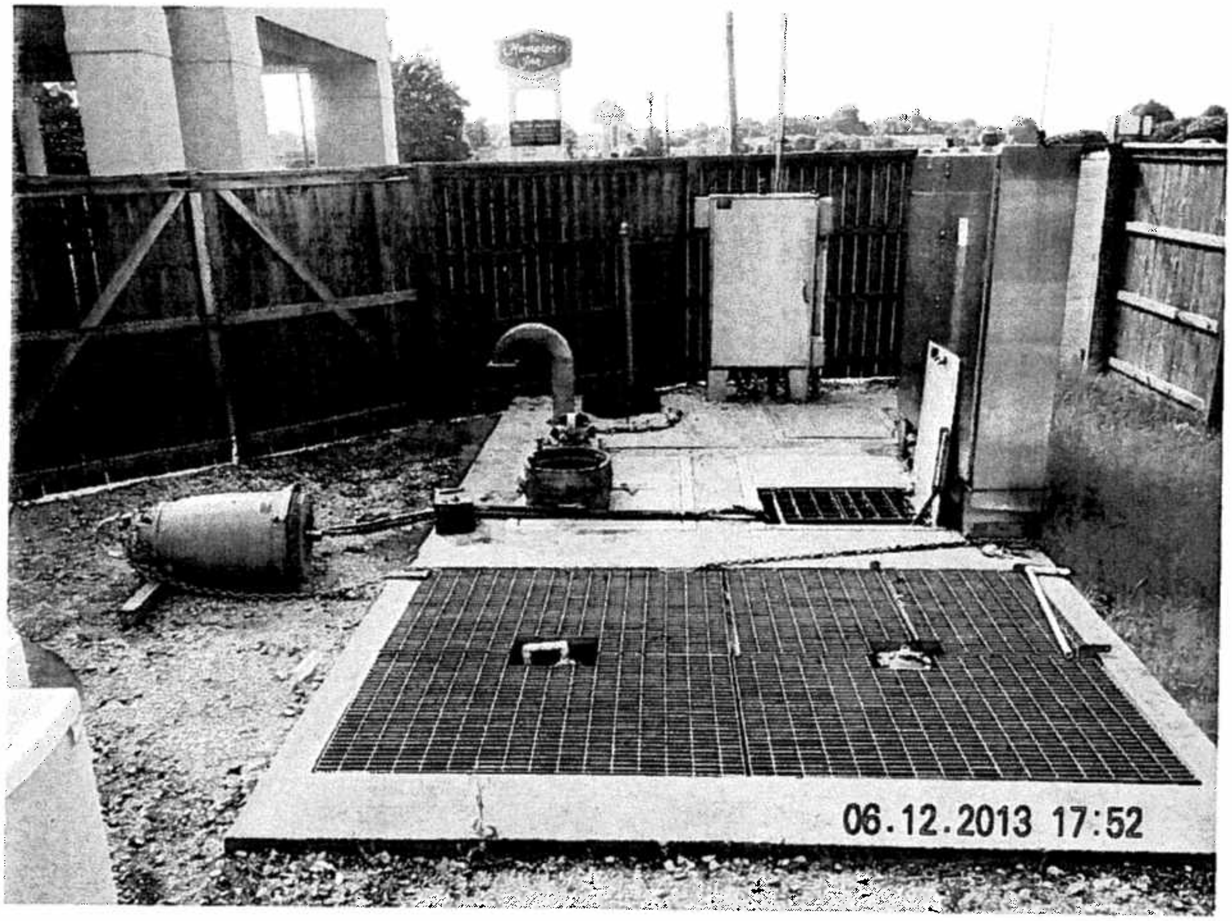


Figure 3. Hampton Inn pump station power and instrument controls. Note that 1 pump has been pulled for maintenance.

Attachment B: Attendance List

NAME	REPRESENTING	PHONE	ATTENDED
Brad Ammons	EPA Region 4	(404) 562-9769	Interview and Field visits
Jim Harvey	MDEQ, Jackson	(601) 961-5591	Interview and Field visits
Steven Bigelow, P.E.	City of Olive Branch	(662) 895-2827	Interview and Crape Myrtle Drive field visit
Larry McClure	City of Olive Branch	(662) 893-5200	Crape Myrtle Drive field visit + pump station interview
Lanny May	City of Olive Branch	(662) 893-5249	Field visits + pump station interview

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAR 31 2014

CERTIFIED MAIL 7009 0960 0000 6489 3351
RETURN RECEIPT REQUESTED

Mr. Scott Stiles
Director
Public Works Department
City of Cornersville
118 South Main Street
Cornersville, Tennessee 37047

Re: Notice of Violation No. 309-2014-04
Information Request pursuant to Section 308 of the Clean Water Act
National Pollutant Discharge Elimination System Permit No.: TN0061841
Diagnostic Evaluation Report

Dear Mr. Stiles:

The Diagnostic Evaluation Inspection report (Report), written for the City of Cornersville Wastewater Treatment Plant (City) inspection that was conducted by the U.S. Environmental Protection Agency Region 4's Science and Ecosystem Support Division on May 6-7, 2013, is included as an enclosure to this letter. The purpose of the inspection was to determine why effluent limit exceedances have occurred at the plant and to determine the City's compliance with the permit. The Report outlines several findings and also includes the following deficiencies that the City must address to ensure full compliance with its National Pollution Discharge Elimination System (Permit) Permit No.: TN0061841:

1. The 24 Hour composite samples were collected over a shorter time period than the 24 hours specified in the Permit (Part 1 of Permit);
2. The flow meter at outfall 001 was recording 25 percent less than the actual flow exceeding the requirement of within ± 10 percent of the primary flow measuring device (Part 1.2.1 of Permit);
3. The plant was experiencing the following operation and maintenance issues at the plant that affected compliance with the permit (Part 2.1.4 of Permit):
   - The 1.2 million gallon equalization tank was near to exceeding capacity;
   - The Ultra Violet disinfection lamps did not appear to be clean;
   - The flow monitoring data reviewed within 15 months of the inspection showed that the plant was hydraulically overloaded for five months;
   - There was not a preliminary treatment system (bar screen, grit removal) to remove solids and trash from the influent wastewater; and
   - Solids buildup was observed in effluent trough and Parshall flume crest which were affecting accuracy of flow measurement.

4. The plants sample collection and monitoring procedures were not representative of the monitored activity (Part 1.2.1. of the Permit);
   - The pH buffer solution used for instrument calibration was expired;
   - The influent composite sampler was located after the equalization tank which does not allow representative sampling of the influent; and
   - The influent composite sampler tubing was clogged.

Pursuant to Section 309(a)(1) of the Clean Water Act (CWA), 33 U.S.C. §1319(a)(1), the EPA also hereby notifies the City that on numerous occasions the City violated its Permit as indicated by the effluent limit exceedances identified in Enclosure A.

The EPA requests, pursuant to Section 308 of the CWA, 33 U.S.C. § 1318, that the City provide a written response for the inspection deficiencies noted above as well as each of the effluent limit exceedances listed in Enclosure A. The City's response should include a written explanation of the reasons for each of the aforementioned violations and a summary of actions taken or planned by the City to correct the problems and to prevent future violations. In instances where the actions are planned, please include a schedule for completing the actions. The City's written response to the EPA shall be due within 30 days from receipt of this letter. The submittal must be addressed to:

Ms. Alenda Johnson
U.S. Environmental Protection Agency, Region 4
Clean Water Enforcement Branch
61 Forsyth Street, S.W.
Atlanta, Georgia 30303-8960

The City's response should specifically reference the particular element and page number of the Report and should be organized for the purpose of clarity. In addition, all information submitted must be accompanied by the following certification signed by a responsible City official:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Failure to comply with this information request may result in enforcement proceedings under Section 309 of the CWA, 33 U.S.C. § 1319, which could result in the judicial imposition of civil or criminal penalties or the administrative imposition of civil penalties. In addition, there is potential criminal liability for the falsification of any response to the requested information.

The City shall preserve, until further notice, all records (either written or electronic) that exist at the time of receipt of this letter that relate to any of the matters set forth in this letter. The term "records" shall be interpreted in the broadest sense to include information of every sort. The response to this information request shall include assurance that these record protection provisions were put in place, as required. No such records shall be disposed of until written authorization is received from the Chief of the Clean Water Enforcement Branch of the EPA, Region 4.

If you believe that any of the requested information constitutes confidential business information you may assert a confidentiality claim with respect to such information except for effluent data. Further details, including how to make a business confidentiality claim, are found in Enclosure C.

The State of Tennessee is being concurrently notified of these findings. The EPA is coordinating with the State to ensure that timely and appropriate enforcement action is taken and compliance with the conditions of the Permit is achieved.

If these findings are not resolved in a timely or appropriate manner, the EPA may take enforcement action, which may include issuance of an administrative order, assessment of administrative penalties, or initiation of a civil judicial action pursuant to Section 309 of the CWA, 33 U.S.C. § 1319.

If you have questions regarding this notice and information request, please contact Ms. Alenda Johnson, of my staff, at (404) 562-9761 or via e-mail at johnson.alenda@epa.gov.

Sincerely,

James D. Giattina
Director
Water Protection Division

Enclosures

cc: Dr. Sandra Dudley, Director
Tennessee Department of Environment and Conservation

ENCLOSURE A

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Solids, total suspended	Monthly Avg. Min.	30.	22.2	mg/L	001G	01/31/2009
Solids, total suspended	Weekly Average	40.	44.2	mg/L	001G	01/31/2009
Solids, total suspended	Daily Maximum	45.	50.	mg/L	001G	01/31/2009
Solids, total suspended	Daily Maximum	37.5	59.5	lb/d	001G	01/31/2009
Solids, total suspended	Weekly Average	33.	120.5	lb/d	001G	01/31/2009
Total Ammonia Nitrogen	Monthly Average	1.9	13.06	mg/L	001G	01/31/2009
Total Ammonia Nitrogen	Weekly Average	2.4	19.43	mg/L	001G	01/31/2009
Total Ammonia Nitrogen	Daily Maximum	4.	21.11	mg/L	001G	01/31/2009
Total Ammonia Nitrogen	Monthly Average	1.6	11.36	lb/d	001G	01/31/2009
Total Ammonia Nitrogen	Daily Maximum	3.3	17.69	lb/d	001G	01/31/2009
Total Ammonia Nitrogen	Weekly Average	2.	10.9	lb/d	001G	01/31/2009
E. coli, MTEC-MF	Daily Maximum	941.	941.	#/100mL	001G	01/31/2009
BOD, carbonaceous, 05 day, 20 C	Monthly Average	10.	12.6	mg/L	001G	01/31/2009
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	20.	22.4	mg/L	001G	01/31/2009
BOD, carbonaceous, 05 day, 20 C	Monthly Average	8.	10.8	lb/d	001G	01/31/2009
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	14.4	lb/d	001G	01/31/2009
Solids, total suspended	Monthly Avg. Min.	30.	18.7	mg/L	001G	02/28/2009
Total Ammonia Nitrogen	Monthly Average	1.9	18.56	mg/L	001G	02/28/2009
Total Ammonia Nitrogen	Weekly Average	2.4	22.42	mg/L	001G	02/28/2009
Total Ammonia Nitrogen	Daily Maximum	4.	23.24	mg/L	001G	02/28/2009
Total Ammonia Nitrogen	Monthly Average	1.6	14.85	lb/d	001G	02/28/2009
Total Ammonia Nitrogen	Daily Maximum	3.3	28.2	lb/d	001G	02/28/2009
Total Ammonia Nitrogen	Weekly Average	2.	14.9	lb/d	001G	02/28/2009
E. coli, MTEC-MF	Monthly Geomean	126.	565.	#/100mL	001G	02/28/2009
E. coli, MTEC-MF	Daily Maximum	941.	5040.	#/100mL	001G	02/28/2009
BOD, carbonaceous, 05 day, 20 C	Monthly Average	10.	15.8	mg/L	001G	02/28/2009
BOD, carbonaceous, 05 day, 20 C	Weekly Average	15.	15.8	mg/L	001G	02/28/2009
BOD, carbonaceous, 05 day, 20 C	Monthly Average	8.	12.9	lb/d	001G	02/28/2009
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	24.58	lb/d	001G	02/28/2009
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	15.2	lb/d	001G	02/28/2009
Solids, total suspended	Daily Maximum	45.	56.	mg/L	001G	03/31/2009
Solids, total suspended	Monthly Average	25.	25.3	lb/d	001G	03/31/2009
Solids, total suspended	Daily Maximum	37.5	53.7	lb/d	001G	03/31/2009
Solids, total suspended	Weekly Average	33.	47.1	lb/d	001G	03/31/2009
Total Ammonia Nitrogen	Monthly Average	1.9	16.76	mg/L	001G	03/31/2009
Total Ammonia Nitrogen	Weekly Average	2.4	24.6	mg/L	001G	03/31/2009
Total Ammonia Nitrogen	Daily Maximum	4.	26.94	mg/L	001G	03/31/2009

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Monthly Average	1.6	12.68	lb/d	001G	03/31/2009
Total Ammonia Nitrogen	Daily Maximum	3.3	20.93	lb/d	001G	03/31/2009
Total Ammonia Nitrogen	Weekly Average	2.	12.7	lb/d	001G	03/31/2009
E. coli, MTEC-MF	Daily Maximum	941.	1100.	#/100mL	001G	03/31/2009
BOD, carbonaceous, 05 day, 20 C	Monthly Average	10.	17.3	mg/L	001G	03/31/2009
BOD, carbonaceous, 05 day, 20 C	Weekly Average	15.	17.3	mg/L	001G	03/31/2009
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	20.	23.4	mg/L	001G	03/31/2009
BOD, carbonaceous, 05 day, 20 C	Monthly Average	8.	13.5	lb/d	001G	03/31/2009
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	19.5	lb/d	001G	03/31/2009
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	17.6	lb/d	001G	03/31/2009
Solids, total suspended	Weekly Average	40.	52.4	mg/L	001G	04/30/2009
Solids, total suspended	Daily Maximum	45.	380.	mg/L	001G	04/30/2009
Solids, total suspended	Monthly Average	25.	38.7	lb/d	001G	04/30/2009
Solids, total suspended	Daily Maximum	37.5	278.9	lb/d	001G	04/30/2009
Solids, total suspended	Weekly Average	33.	101.2	lb/d	001G	04/30/2009
Solids, settleable	Daily Maximum	1.	22.	mL/L	001G	04/30/2009
Total Ammonia Nitrogen	Monthly Average	1.9	10.46	mg/L	001G	04/30/2009
Total Ammonia Nitrogen	Weekly Average	2.4	12.49	mg/L	001G	04/30/2009
Total Ammonia Nitrogen	Daily Maximum	4.	17.08	mg/L	001G	04/30/2009
Total Ammonia Nitrogen	Monthly Average	1.6	7.76	lb/d	001G	04/30/2009
Total Ammonia Nitrogen	Daily Maximum	3.3	11.97	lb/d	001G	04/30/2009
Total Ammonia Nitrogen	Weekly Average	2.	7.3	lb/d	001G	04/30/2009
Solids, total suspended	Monthly Avg. Min.	30.	28.9	mg/L	001G	05/31/2009
Solids, total suspended	Daily Maximum	37.5	38.3	lb/d	001G	05/31/2009
Solids, settleable	Daily Maximum	1.	3.5	mL/L	001G	05/31/2009
Total Ammonia Nitrogen	Monthly Average	1.1	7.95	mg/L	001G	05/31/2009
Total Ammonia Nitrogen	Weekly Average	2.	9.04	mg/L	001G	05/31/2009
Total Ammonia Nitrogen	Daily Maximum	2.5	15.57	mg/L	001G	05/31/2009
Total Ammonia Nitrogen	Monthly Average	.9	6.83	lb/d	001G	05/31/2009
Total Ammonia Nitrogen	Daily Maximum	2.1	7.07	lb/d	001G	05/31/2009
Total Ammonia Nitrogen	Weekly Average	1.7	7.07	lb/d	001G	05/31/2009
E. coli, MTEC-MF	Daily Maximum	941.	5400.	#/100mL	001G	05/31/2009
Solids, total suspended	Monthly Avg. Min.	30.	17.3	mg/L	001G	06/30/2009
Solids, total suspended	Monthly Avg. Min.	30.	9.	mg/L	001G	07/31/2009
Solids, total suspended	Monthly Avg. Min.	30.	7.3	mg/L	001G	08/31/2009
Total Ammonia Nitrogen	Monthly Average	1.1	2.86	mg/L	001G	08/31/2009
Total Ammonia Nitrogen	Weekly Average	2.	2.3	mg/L	001G	08/31/2009
Total Ammonia Nitrogen	Daily Maximum	2.5	11.09	mg/L	001G	08/31/2009
Total Ammonia Nitrogen	Monthly Average	.9	1.42	lb/d	001G	08/31/2009
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	20.	31.	mg/L	001G	08/31/2009

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Solids, total suspended	Monthly Avg. Min.	30.	11.4	mg/L	001G	09/30/2009
Total Ammonia Nitrogen	Monthly Average	1.1	1.61	mg/L	001G	09/30/2009
Total Ammonia Nitrogen	Daily Maximum	2.5	9.91	mg/L	001G	09/30/2009
Total Ammonia Nitrogen	Monthly Average	.9	2.54	lb/d	001G	09/30/2009
Total Ammonia Nitrogen	Daily Maximum	2.1	2.52	lb/d	001G	09/30/2009
Total Ammonia Nitrogen	Weekly Average	1.7	2.52	lb/d	001G	09/30/2009
Solids, total suspended	Monthly Avg. Min.	30.	7.6	mg/L	001G	10/31/2009
Total Ammonia Nitrogen	Monthly Average	1.1	2.89	mg/L	001G	10/31/2009
Total Ammonia Nitrogen	Weekly Average	2.	2.83	mg/L	001G	10/31/2009
Total Ammonia Nitrogen	Daily Maximum	2.5	13.33	mg/L	001G	10/31/2009
Total Ammonia Nitrogen	Monthly Average	.9	3.61	lb/d	001G	10/31/2009
Total Ammonia Nitrogen	Daily Maximum	2.1	3.55	lb/d	001G	10/31/2009
Total Ammonia Nitrogen	Weekly Average	1.7	3.55	lb/d	001G	10/31/2009
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	10/31/2009
Solids, total suspended	Monthly Avg. Min.	30.	13.3	mg/L	001G	11/30/2009
Solids, total suspended	Monthly Avg. Min.	30.	18.1	mg/L	001G	12/31/2009
Solids, total suspended	Daily Maximum	45.	52.5	mg/L	001G	12/31/2009
Solids, total suspended	Daily Maximum	37.5	67.9	lb/d	001G	12/31/2009
Solids, total suspended	Weekly Average	33.	54.9	lb/d	001G	12/31/2009
Solids, total suspended	Monthly Avg. Min.	30.	24.7	mg/L	001G	01/31/2010
Solids, total suspended	Daily Maximum	45.	56.	mg/L	001G	01/31/2010
Solids, total suspended	Daily Maximum	37.5	62.8	lb/d	001G	01/31/2010
Solids, total suspended	Weekly Average	33.	52.3	lb/d	001G	01/31/2010
Solids, settleable	Daily Maximum	1.	10.	mL/L	001G	01/31/2010
Total Ammonia Nitrogen	Monthly Average	1.9	3.38	mg/L	001G	01/31/2010
Total Ammonia Nitrogen	Weekly Average	2.4	7.28	mg/L	001G	01/31/2010
Total Ammonia Nitrogen	Daily Maximum	4.	8.34	mg/L	001G	01/31/2010
Total Ammonia Nitrogen	Monthly Average	1.6	2.86	lb/d	001G	01/31/2010
Total Ammonia Nitrogen	Daily Maximum	3.3	7.13	lb/d	001G	01/31/2010
Total Ammonia Nitrogen	Weekly Average	2.	2.5	lb/d	001G	01/31/2010
E. coli, MTEC-MF	Daily Maximum	941.	72914.	#/100mL	001G	01/31/2010
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	20.	20.9	mg/L	001G	01/31/2010
BOD, carbonaceous, 05 day, 20 C	Monthly Average	8.	8.1	lb/d	001G	01/31/2010
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	19.9	lb/d	001G	01/31/2010
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	16.3	lb/d	001G	01/31/2010
Solids, suspended percent removal	Monthly Avg. Min.	60.	57.9	%	001G	01/31/2010
Solids, total suspended	Monthly Avg. Min.	30.	15.8	mg/L	001G	02/28/2010
Solids, total suspended	Daily Maximum	45.	51.5	mg/L	001G	02/28/2010
Solids, total suspended	Daily Maximum	37.5	75.8	lb/d	001G	02/28/2010
Solids, total suspended	Weekly Average	33.	36.9	lb/d	001G	02/28/2010
Total Ammonia Nitrogen	Daily Maximum	4.	4.98	mg/L	001G	02/28/2010

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Daily Maximum	3.3	3.85	lb/d	001G	02/28/2010
Solids, total suspended	Monthly Avg. Min.	30.	27.2	mg/L	001G	03/31/2010
Solids, total suspended	Daily Maximum	45.	73.	mg/L	001G	03/31/2010
Solids, total suspended	Daily Maximum	37.5	85.1	lb/d	001G	03/31/2010
Solids, settleable	Daily Maximum	1.	1.5	mL/L	001G	03/31/2010
Total Ammonia Nitrogen	Monthly Average	1.9	3.05	mg/L	001G	03/31/2010
Total Ammonia Nitrogen	Weekly Average	2.4	8.14	mg/L	001G	03/31/2010
Total Ammonia Nitrogen	Daily Maximum	4.	9.91	mg/L	001G	03/31/2010
Total Ammonia Nitrogen	Monthly Average	1.6	1.91	lb/d	001G	03/31/2010
Total Ammonia Nitrogen	Daily Maximum	3.3	6.33	lb/d	001G	03/31/2010
Solids, total suspended	Weekly Average	40.	44.2	mg/L	001G	04/30/2010
Solids, total suspended	Daily Maximum	45.	157.	mg/L	001G	04/30/2010
Solids, total suspended	Monthly Average	25.	35.7	lb/d	001G	04/30/2010
Solids, total suspended	Daily Maximum	37.5	140.5	lb/d	001G	04/30/2010
Solids, total suspended	Weekly Average	33.	108.3	lb/d	001G	04/30/2010
Solids, settleable	Daily Maximum	1.	4.5	mL/L	001G	04/30/2010
Total Ammonia Nitrogen	Weekly Average	2.4	2.63	mg/L	001G	04/30/2010
Total Ammonia Nitrogen	Daily Maximum	4.	5.66	mg/L	001G	04/30/2010
Total Ammonia Nitrogen	Daily Maximum	3.3	6.68	lb/d	001G	04/30/2010
E. coli, MTEC-MF	Monthly Geomean	126.	204.	#/100mL	001G	04/30/2010
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	04/30/2010
BOD, carbonaceous, 05 day, 20 C	Monthly Average	10.	10.5	mg/L	001G	04/30/2010
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	20.	27.	mg/L	001G	04/30/2010
BOD, carbonaceous, 05 day, 20 C	Monthly Average	8.	8.6	lb/d	001G	04/30/2010
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	23.1	lb/d	001G	04/30/2010
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	20.6	lb/d	001G	04/30/2010
Solids, total suspended	Monthly Avg. Min.	30.	7.3	mg/L	001G	05/31/2010
Total Ammonia Nitrogen	Monthly Average	1.1	5.67	mg/L	001G	05/31/2010
Total Ammonia Nitrogen	Weekly Average	2.	4.55	mg/L	001G	05/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.5	28.	mg/L	001G	05/31/2010
Total Ammonia Nitrogen	Monthly Average	.9	3.71	lb/d	001G	05/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.1	3.14	lb/d	001G	05/31/2010
Total Ammonia Nitrogen	Weekly Average	1.7	3.14	lb/d	001G	05/31/2010
E. coli, MTEC-MF	Monthly Geomean	126.	277.	#/100mL	001G	05/31/2010
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	05/31/2010
Solids, total suspended	Monthly Avg. Min.	30.	13.9	mg/L	001G	06/30/2010
Solids, total suspended	Daily Maximum	45.	52.	mg/L	001G	06/30/2010
Total Ammonia Nitrogen	Monthly Average	1.1	14.73	mg/L	001G	06/30/2010
Total Ammonia Nitrogen	Weekly Average	2.	15.26	mg/L	001G	06/30/2010
Total Ammonia Nitrogen	Daily Maximum	2.5	43.01	mg/L	001G	06/30/2010
Total Ammonia Nitrogen	Monthly Average	.9	9.06	lb/d	001G	06/30/2010

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Daily Maximum	2.1	9.43	lb/d	001G	06/30/2010
Total Ammonia Nitrogen	Weekly Average	1.7	9.42	lb/d	001G	06/30/2010
E. coli, MTEC-MF	Daily Maximum	941.	2420.	#/100mL	001G	06/30/2010
Solids, total suspended	Monthly Avg. Min.	30.	9.5	mg/L	001G	07/31/2010
Solids, settleable	Daily Maximum	1.	4.5	mL/L	001G	07/31/2010
Total Ammonia Nitrogen	Monthly Average	1.1	6.35	mg/L	001G	07/31/2010
Total Ammonia Nitrogen	Weekly Average	2.	6.48	mg/L	001G	07/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.5	18.82	mg/L	001G	07/31/2010
Total Ammonia Nitrogen	Monthly Average	.9	3.42	lb/d	001G	07/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.1	3.5	lb/d	001G	07/31/2010
Total Ammonia Nitrogen	Weekly Average	1.7	17.3	lb/d	001G	07/31/2010
Solids, total suspended	Monthly Avg. Min.	30.	6.3	mg/L	001G	08/31/2010
Total Ammonia Nitrogen	Monthly Average	1.1	25.05	mg/L	001G	08/31/2010
Total Ammonia Nitrogen	Weekly Average	2.	25.05	mg/L	001G	08/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.5	35.5	mg/L	001G	08/31/2010
Total Ammonia Nitrogen	Monthly Average	.9	13.64	lb/d	001G	08/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.1	13.64	lb/d	001G	08/31/2010
Total Ammonia Nitrogen	Weekly Average	1.7	13.64	lb/d	001G	08/31/2010
E. coli, MTEC-MF	Daily Maximum	941.	1733.	#/100mL	001G	08/31/2010
Solids, total suspended	Monthly Avg. Min.	30.	9.1	mg/L	001G	09/30/2010
Total Ammonia Nitrogen	Monthly Average	1.1	18.86	mg/L	001G	09/30/2010
Total Ammonia Nitrogen	Weekly Average	2.	21.45	mg/L	001G	09/30/2010
Total Ammonia Nitrogen	Daily Maximum	2.5	33.94	mg/L	001G	09/30/2010
Total Ammonia Nitrogen	Monthly Average	.9	8.22	lb/d	001G	09/30/2010
Total Ammonia Nitrogen	Daily Maximum	2.1	9.34	lb/d	001G	09/30/2010
Total Ammonia Nitrogen	Weekly Average	1.7	7.5	lb/d	001G	09/30/2010
E. coli, MTEC-MF	Monthly Geomean	126.	1448.	#/100mL	001G	09/30/2010
E. coli, MTEC-MF	Daily Maximum	941.	2420.	#/100mL	001G	09/30/2010
Solids, total suspended	Monthly Avg. Min.	30.	13.7	mg/L	001G	10/31/2010
Solids, settleable	Daily Maximum	1.	19.	mL/L	001G	10/31/2010
Total Ammonia Nitrogen	Monthly Average	1.1	4.59	mg/L	001G	10/31/2010
Total Ammonia Nitrogen	Weekly Average	2.	4.16	mg/L	001G	10/31/2010
Total Ammonia Nitrogen	Daily Maximum	2.5	10.19	mg/L	001G	10/31/2010
Total Ammonia Nitrogen	Monthly Average	.9	1.84	lb/d	001G	10/31/2010
E. coli, MTEC-MF	Monthly Geomean	126.	140.	#/100mL	001G	10/31/2010
Solids, total suspended	Monthly Avg. Min.	30.	17.7	mg/L	001G	11/30/2010
Solids, total suspended	Daily Maximum	45.	93.5	mg/L	001G	11/30/2010
Solids, total suspended	Daily Maximum	37.5	50.1	lb/d	001G	11/30/2010
Solids, settleable	Daily Maximum	1.	3.	mL/L	001G	11/30/2010
Total Ammonia Nitrogen	Monthly Average	1.9	14.81	mg/L	001G	11/30/2010
Total Ammonia Nitrogen	Weekly Average	2.4	23.22	mg/L	001G	11/30/2010
Total Ammonia Nitrogen	Daily Maximum	4.	23.91	mg/L	001G	11/30/2010
Total Ammonia Nitrogen	Monthly Average	1.6	9.91	lb/d	001G	11/30/2010
Total Ammonia Nitrogen	Daily Maximum	3.3	17.77	lb/d	001G	11/30/2010

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Weekly Average	2.	9.9	lb/d	001G	11/30/2010
E. coli, MTEC-MF	Monthly Geomean	126.	2056.	#/100mL	001G	11/30/2010
E. coli, MTEC-MF	Daily Maximum	941.	2420.	#/100mL	001G	11/30/2010
Solids, total suspended	Monthly Avg. Min.	30.	28.3	mg/L	001G	12/31/2010
Solids, total suspended	Daily Maximum	45.	133.	mg/L	001G	12/31/2010
Solids, total suspended	Daily Maximum	37.5	75.7	lb/d	001G	12/31/2010
Solids, settleable	Daily Maximum	1.	10.	mL/L	001G	12/31/2010
Total Ammonia Nitrogen	Monthly Average	1.9	4.3	mg/L	001G	12/31/2010
Total Ammonia Nitrogen	Weekly Average	2.4	6.31	mg/L	001G	12/31/2010
Total Ammonia Nitrogen	Daily Maximum	4.	12.1	mg/L	001G	12/31/2010
Total Ammonia Nitrogen	Monthly Average	1.6	2.31	lb/d	001G	12/31/2010
Total Ammonia Nitrogen	Daily Maximum	3.3	5.67	lb/d	001G	12/31/2010
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	12/31/2010
Solids, total suspended	Monthly Avg. Min.	30.	5.9	mg/L	001G	01/31/2011
Solids, settleable	Daily Maximum	1.	1.5	mL/L	001G	01/31/2011
Total Ammonia Nitrogen	Monthly Average	1.9	2.9	mg/L	001G	01/31/2011
Total Ammonia Nitrogen	Weekly Average	2.4	11.93	mg/L	001G	01/31/2011
Total Ammonia Nitrogen	Daily Maximum	4.	6.22	mg/L	001G	01/31/2011
Total Ammonia Nitrogen	Monthly Average	1.6	1.86	lb/d	001G	01/31/2011
Total Ammonia Nitrogen	Daily Maximum	3.3	3.49	lb/d	001G	01/31/2011
Total Ammonia Nitrogen	Weekly Average	2.	2.6	lb/d	001G	01/31/2011
Solids, total suspended	Weekly Average	40.	72.5	mg/L	001G	02/28/2011
Solids, total suspended	Daily Maximum	45.	173.	mg/L	001G	02/28/2011
Solids, total suspended	Monthly Average	25.	55.1	lb/d	001G	02/28/2011
Solids, total suspended	Daily Maximum	37.5	129.9	lb/d	001G	02/28/2011
Solids, total suspended	Weekly Average	33.	102.4	lb/d	001G	02/28/2011
Solids, settleable	Daily Maximum	1.	5.	mL/L	001G	02/28/2011
Total Ammonia Nitrogen	Monthly Average	1.9	6.8	mg/L	001G	02/28/2011
Total Ammonia Nitrogen	Weekly Average	2.4	8.12	mg/L	001G	02/28/2011
Total Ammonia Nitrogen	Daily Maximum	4.	10.98	mg/L	001G	02/28/2011
Total Ammonia Nitrogen	Monthly Average	1.6	5.28	lb/d	001G	02/28/2011
Total Ammonia Nitrogen	Daily Maximum	3.3	8.24	lb/d	001G	02/28/2011
Total Ammonia Nitrogen	Weekly Average	2.	5.3	lb/d	001G	02/28/2011
E. coli, MTEC-MF	Monthly Geomean	126.	273.	#/100mL	001G	02/28/2011
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	02/28/2011
Solids, total suspended	Daily Maximum	45.	162.	mg/L	001G	03/31/2011
Solids, total suspended	Monthly Average	25.	48.2	lb/d	001G	03/31/2011
Solids, total suspended	Daily Maximum	37.5	165.1	lb/d	001G	03/31/2011
Solids, total suspended	Weekly Average	33.	85.7	lb/d	001G	03/31/2011
Solids, settleable	Daily Maximum	1.	16.	mL/L	001G	03/31/2011
Total Ammonia Nitrogen	Daily Maximum	4.	4.14	mg/L	001G	03/31/2011
Total Ammonia Nitrogen	Daily Maximum	3.3	5.13	lb/d	001G	03/31/2011
E. coli, MTEC-MF	Daily Maximum	941.	961.	#/100mL	001G	03/31/2011
Solids, total suspended	Monthly Avg. Min.	30.	16.9	mg/L	001G	04/30/2011

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Solids, total suspended	Daily Maximum	45.	81.	mg/L	001G	04/30/2011
Solids, total suspended	Daily Maximum	37.5	65.6	lb/d	001G	04/30/2011
Solids, total suspended	Weekly Average	33.	82.5	lb/d	001G	04/30/2011
Solids, settleable	Daily Maximum	1.	1.5	mL/L	001G	04/30/2011
Total Ammonia Nitrogen	Monthly Average	1.9	2.39	mg/L	001G	04/30/2011
Total Ammonia Nitrogen	Weekly Average	2.4	6.42	mg/L	001G	04/30/2011
Total Ammonia Nitrogen	Daily Maximum	4.	8.18	mg/L	001G	04/30/2011
Total Ammonia Nitrogen	Monthly Average	1.6	2.62	lb/d	001G	04/30/2011
Total Ammonia Nitrogen	Daily Maximum	3.3	8.49	lb/d	001G	04/30/2011
Total Ammonia Nitrogen	Weekly Average	2.	2.3	lb/d	001G	04/30/2011
E. coli, MTEC-MF	Monthly Geomean	126.	134.	#/100mL	001G	04/30/2011
E. coli, MTEC-MF	Daily Maximum	941.	1413.6	#/100mL	001G	04/30/2011
Solids, total suspended	Monthly Avg. Min.	30.	20.4	mg/L	001G	05/31/2011
Solids, total suspended	Daily Maximum	45.	141.	mg/L	001G	05/31/2011
Solids, total suspended	Daily Maximum	37.5	90.7	lb/d	001G	05/31/2011
Solids, settleable	Daily Maximum	1.	4.	mL/L	001G	05/31/2011
Total Ammonia Nitrogen	Monthly Average	1.1	3.27	mg/L	001G	05/31/2011
Total Ammonia Nitrogen	Weekly Average	2.	3.27	mg/L	001G	05/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.5	13.1	mg/L	001G	05/31/2011
Total Ammonia Nitrogen	Monthly Average	.9	3.41	lb/d	001G	05/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.1	3.41	lb/d	001G	05/31/2011
Total Ammonia Nitrogen	Weekly Average	1.7	3.41	lb/d	001G	05/31/2011
Solids, total suspended	Monthly Avg. Min.	30.	8.5	mg/L	001G	06/30/2011
Total Ammonia Nitrogen	Monthly Average	1.1	5.71	mg/L	001G	06/30/2011
Total Ammonia Nitrogen	Weekly Average	2.	5.24	mg/L	001G	06/30/2011
Total Ammonia Nitrogen	Daily Maximum	2.5	24.42	mg/L	001G	06/30/2011
Total Ammonia Nitrogen	Monthly Average	.9	3.67	lb/d	001G	06/30/2011
Total Ammonia Nitrogen	Daily Maximum	2.1	3.75	lb/d	001G	06/30/2011
Total Ammonia Nitrogen	Weekly Average	1.7	3.75	lb/d	001G	06/30/2011
E. coli, MTEC-MF	Monthly Geomean	126.	852.	#/100mL	001G	06/30/2011
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	06/30/2011
Solids, total suspended	Monthly Avg. Min.	30.	11.	mg/L	001G	07/31/2011
Total Ammonia Nitrogen	Monthly Average	1.1	15.18	mg/L	001G	07/31/2011
Total Ammonia Nitrogen	Weekly Average	2.	14.3	mg/L	001G	07/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.5	35.06	mg/L	001G	07/31/2011
Total Ammonia Nitrogen	Monthly Average	.9	8.1	lb/d	001G	07/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.1	7.47	lb/d	001G	07/31/2011
Total Ammonia Nitrogen	Weekly Average	1.7	7.47	lb/d	001G	07/31/2011
E. coli, MTEC-MF	Monthly Geomean	126.	993.	#/100mL	001G	07/31/2011
E. coli, MTEC-MF	Daily Maximum	941.	72419.	#/100mL	001G	07/31/2011
Solids, total suspended	Monthly Avg. Min.	30.	9.	mg/L	001G	08/31/2011
Total Ammonia Nitrogen	Monthly Average	1.1	31.64	mg/L	001G	08/31/2011
Total Ammonia Nitrogen	Weekly Average	2.	32.97	mg/L	001G	08/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.5	40.99	mg/L	001G	08/31/2011

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Monthly Average	.9	14.88	lb/d	001G	08/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.1	15.6	lb/d	001G	08/31/2011
Total Ammonia Nitrogen	Weekly Average	1.7	15.6	lb/d	001G	08/31/2011
E. coli, MTEC-MF	Monthly Geomean	126.	1622.	#/100mL	001G	08/31/2011
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	08/31/2011
Solids, total suspended	Monthly Avg. Min.	30.	5.6	mg/L	001G	09/30/2011
Total Ammonia Nitrogen	Monthly Average	1.1	6.52	mg/L	001G	09/30/2011
Total Ammonia Nitrogen	Weekly Average	2.	7.13	mg/L	001G	09/30/2011
Total Ammonia Nitrogen	Daily Maximum	2.5	20.5	mg/L	001G	09/30/2011
Total Ammonia Nitrogen	Monthly Average	.9	3.9	lb/d	001G	09/30/2011
Total Ammonia Nitrogen	Daily Maximum	2.1	4.06	lb/d	001G	09/30/2011
Total Ammonia Nitrogen	Weekly Average	1.7	4.06	lb/d	001G	09/30/2011
E. coli, MTEC-MF	Daily Maximum	941.	1011.	#/100mL	001G	09/30/2011
Solids, total suspended	Monthly Avg. Min.	30.	6.2	mg/L	001G	10/31/2011
Solids, settleable	Daily Maximum	1.	17.	mL/L	001G	10/31/2011
Total Ammonia Nitrogen	Monthly Average	1.1	6.89	mg/L	001G	10/31/2011
Total Ammonia Nitrogen	Weekly Average	2.	6.78	mg/L	001G	10/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.5	16.35	mg/L	001G	10/31/2011
Total Ammonia Nitrogen	Monthly Average	.9	3.26	lb/d	001G	10/31/2011
Total Ammonia Nitrogen	Daily Maximum	2.1	3.23	lb/d	001G	10/31/2011
Total Ammonia Nitrogen	Weekly Average	1.7	3.23	lb/d	001G	10/31/2011
Solids, total suspended	Monthly Avg. Min.	30.	6.1	mg/L	001G	11/30/2011
Total Ammonia Nitrogen	Monthly Average	1.9	7.31	mg/L	001G	11/30/2011
Total Ammonia Nitrogen	Weekly Average	2.4	19.73	mg/L	001G	11/30/2011
Total Ammonia Nitrogen	Daily Maximum	4.	22.12	mg/L	001G	11/30/2011
Total Ammonia Nitrogen	Monthly Average	1.6	5.06	lb/d	001G	11/30/2011
Total Ammonia Nitrogen	Daily Maximum	3.3	15.55	lb/d	001G	11/30/2011
Total Ammonia Nitrogen	Weekly Average	2.	5.5	lb/d	001G	11/30/2011
E. coli, MTEC-MF	Monthly Geomean	126.	347.	#/100mL	001G	11/30/2011
E. coli, MTEC-MF	Daily Maximum	941.	2419.	#/100mL	001G	11/30/2011
Solids, total suspended	Monthly Avg. Min.	30.	22.3	mg/L	001G	12/31/2011
Solids, total suspended	Daily Maximum	45.	54.	mg/L	001G	12/31/2011
Solids, total suspended	Monthly Average	25.	31.2	lb/d	001G	12/31/2011
Solids, total suspended	Daily Maximum	37.5	76.2	lb/d	001G	12/31/2011
Solids, total suspended	Weekly Average	33.	71.6	lb/d	001G	12/31/2011
Solids, settleable	Daily Maximum	1.	9.	mL/L	001G	12/31/2011
BOD, carbonaceous, 05 day, 20 C	Monthly Average	8.	10.1	lb/d	001G	12/31/2011
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	21.8	lb/d	001G	12/31/2011
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	18.2	lb/d	001G	12/31/2011
Solids, total suspended	Monthly Avg. Min.	30.	8.9	mg/L	001G	01/31/2012
Solids, total suspended	Daily Maximum	45.	55.	mg/L	001G	01/31/2012
Solids, total suspended	Daily Maximum	37.5	55.1	lb/d	001G	01/31/2012

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Solids, settleable	Daily Maximum	1.	16.	mL/L	001G	01/31/2012
Total Ammonia Nitrogen	Monthly Average	1.9	2.36	mg/L	001G	01/31/2012
Total Ammonia Nitrogen	Weekly Average	2.4	5.13	mg/L	001G	01/31/2012
Total Ammonia Nitrogen	Daily Maximum	4.	11.14	mg/L	001G	01/31/2012
Total Ammonia Nitrogen	Monthly Average	1.6	2.09	lb/d	001G	01/31/2012
Total Ammonia Nitrogen	Daily Maximum	3.3	9.6	lb/d	001G	01/31/2012
Total Ammonia Nitrogen	Weekly Average	2.	2.1	lb/d	001G	01/31/2012
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	17.6	lb/d	001G	01/31/2012
Solids, total suspended	Monthly Avg. Min.	30.	6.1	mg/L	001G	02/29/2012
Solids, settleable	Daily Maximum	1.	7.	mL/L	001G	02/29/2012
Solids, total suspended	Monthly Avg. Min.	30.	11.4	mg/L	001G	03/31/2012
Total Ammonia Nitrogen	Monthly Average	1.9	8.7	mg/L	001G	03/31/2012
Total Ammonia Nitrogen	Weekly Average	2.4	20.65	mg/L	001G	03/31/2012
Total Ammonia Nitrogen	Daily Maximum	4.	23.13	mg/L	001G	03/31/2012
Total Ammonia Nitrogen	Monthly Average	1.6	6.3	lb/d	001G	03/31/2012
Total Ammonia Nitrogen	Daily Maximum	3.3	21.07	lb/d	001G	03/31/2012
Total Ammonia Nitrogen	Weekly Average	2.	6.1	lb/d	001G	03/31/2012
Solids, total suspended	Monthly Avg. Min.	30.	7.4	mg/L	001G	04/30/2012
Total Ammonia Nitrogen	Monthly Average	1.9	14.6	mg/L	001G	04/30/2012
Total Ammonia Nitrogen	Weekly Average	2.4	21.91	mg/L	001G	04/30/2012
Total Ammonia Nitrogen	Daily Maximum	4.	25.42	mg/L	001G	04/30/2012
Total Ammonia Nitrogen	Monthly Average	1.6	7.48	lb/d	001G	04/30/2012
Total Ammonia Nitrogen	Daily Maximum	3.3	14.84	lb/d	001G	04/30/2012
Total Ammonia Nitrogen	Weekly Average	2.	7.5	lb/d	001G	04/30/2012
Solids, total suspended	Monthly Avg. Min.	30.	7.4	mg/L	001G	05/31/2012
Solids, settleable	Daily Maximum	1.	3.	mL/L	001G	05/31/2012
Total Ammonia Nitrogen	Monthly Average	1.1	16.39	mg/L	001G	05/31/2012
Total Ammonia Nitrogen	Weekly Average	2.	18.01	mg/L	001G	05/31/2012
Total Ammonia Nitrogen	Daily Maximum	2.5	25.87	mg/L	001G	05/31/2012
Total Ammonia Nitrogen	Monthly Average	.9	7.93	lb/d	001G	05/31/2012
Total Ammonia Nitrogen	Daily Maximum	2.1	8.77	lb/d	001G	05/31/2012
Total Ammonia Nitrogen	Weekly Average	1.7	8.77	lb/d	001G	05/31/2012
E. coli, MTEC-MF	Monthly Geomean	126.	363.	#/100mL	001G	05/31/2012
E. coli, MTEC-MF	Daily Maximum	941.	2119.6	#/100mL	001G	05/31/2012
Solids, total suspended	Monthly Avg. Min.	30.	6.	mg/L	001G	06/30/2012
Total Ammonia Nitrogen	Monthly Average	1.1	6.53	mg/L	001G	06/30/2012
Total Ammonia Nitrogen	Weekly Average	2.	6.55	mg/L	001G	06/30/2012
Total Ammonia Nitrogen	Daily Maximum	2.5	12.88	mg/L	001G	06/30/2012
Total Ammonia Nitrogen	Monthly Average	.9	2.91	lb/d	001G	06/30/2012
Total Ammonia Nitrogen	Daily Maximum	2.1	2.91	lb/d	001G	06/30/2012
Total Ammonia Nitrogen	Weekly Average	1.7	2.91	lb/d	001G	06/30/2012
E. coli, MTEC-MF	Monthly Geomean	126.	549.	#/100mL	001G	06/30/2012
E. coli, MTEC-MF	Daily Maximum	941.	2420.	#/100mL	001G	06/30/2012
Solids, total suspended	Monthly Avg. Min.	30.	3.9	mg/L	001G	07/31/2012

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Monthly Average	1.1	5.92	mg/L	001G	07/31/2012
Total Ammonia Nitrogen	Weekly Average	2.	5.92	mg/L	001G	07/31/2012
Total Ammonia Nitrogen	Daily Maximum	2.5	9.07	mg/L	001G	07/31/2012
Total Ammonia Nitrogen	Monthly Average	.9	3.24	lb/d	001G	07/31/2012
Total Ammonia Nitrogen	Daily Maximum	2.1	3.24	lb/d	001G	07/31/2012
Total Ammonia Nitrogen	Weekly Average	1.7	3.24	lb/d	001G	07/31/2012
E. coli, MTEC-MF	Monthly Geomean	126.	315.	#/100mL	001G	07/31/2012
E. coli, MTEC-MF	Daily Maximum	941.	1986.	#/100mL	001G	07/31/2012
Solids, total suspended	Monthly Avg. Min.	30.	9.1	mg/L	001G	08/31/2012
Solids, total suspended	Weekly Average	33.	86.	lb/d	001G	08/31/2012
Solids, settleable	Daily Maximum	1.	2.	mL/L	001G	08/31/2012
Total Ammonia Nitrogen	Monthly Average	1.1	3.47	mg/L	001G	08/31/2012
Total Ammonia Nitrogen	Weekly Average	2.	3.92	mg/L	001G	08/31/2012
Total Ammonia Nitrogen	Daily Maximum	2.5	6.83	mg/L	001G	08/31/2012
Total Ammonia Nitrogen	Monthly Average	.9	1.68	lb/d	001G	08/31/2012
E. coli, MTEC-MF	Monthly Geomean	126.	630.	#/100mL	001G	08/31/2012
E. coli, MTEC-MF	Daily Maximum	941.	2419.6	#/100mL	001G	08/31/2012
Solids, total suspended	Monthly Avg. Min.	30.	9.	mg/L	001G	09/30/2012
Total Ammonia Nitrogen	Monthly Average	1.1	1.82	mg/L	001G	09/30/2012
Total Ammonia Nitrogen	Weekly Average	2.	2.25	mg/L	001G	09/30/2012
Total Ammonia Nitrogen	Daily Maximum	2.5	5.26	mg/L	001G	09/30/2012
Total Ammonia Nitrogen	Monthly Average	.9	1.15	lb/d	001G	09/30/2012
E. coli, MTEC-MF	Monthly Geomean	126.	207.	#/100mL	001G	09/30/2012
E. coli, MTEC-MF	Daily Maximum	941.	980.	#/100mL	001G	09/30/2012
Solids, total suspended	Monthly Avg. Min.	30.	21.2	mg/L	001G	10/31/2012
Solids, total suspended	Daily Maximum	45.	73.	mg/L	001G	10/31/2012
Solids, total suspended	Daily Maximum	37.5	44.6	lb/d	001G	10/31/2012
Solids, settleable	Daily Maximum	1.	2.5	mL/L	001G	10/31/2012
Total Ammonia Nitrogen	Monthly Average	1.1	2.07	mg/L	001G	10/31/2012
Total Ammonia Nitrogen	Weekly Average	2.	2.15	mg/L	001G	10/31/2012
Total Ammonia Nitrogen	Daily Maximum	2.5	8.57	mg/L	001G	10/31/2012
Total Ammonia Nitrogen	Monthly Average	.9	1.31	lb/d	001G	10/31/2012
E. coli, MTEC-MF	Monthly Geomean	126.	1336.	#/100mL	001G	10/31/2012
E. coli, MTEC-MF	Daily Maximum	941.	2419.6	#/100mL	001G	10/31/2012
Solids, total suspended	Weekly Average	40.	40.7	mg/L	001G	11/30/2012
Solids, total suspended	Daily Maximum	45.	146.	mg/L	001G	11/30/2012
Solids, total suspended	Daily Maximum	37.5	66.5	lb/d	001G	11/30/2012
Solids, total suspended	Weekly Average	33.	54.9	lb/d	001G	11/30/2012
Solids, settleable	Daily Maximum	1.	19.5	mL/L	001G	11/30/2012
E. coli, MTEC-MF	Monthly Geomean	126.	1284.	#/100mL	001G	11/30/2012
E. coli, MTEC-MF	Daily Maximum	941.	2419.6	#/100mL	001G	11/30/2012
Solids, total suspended	Monthly Avg. Min.	30.	27.3	mg/L	001G	12/31/2012
Solids, total suspended	Weekly Average	40.	46.9	mg/L	001G	12/31/2012
Solids, total suspended	Daily Maximum	45.	123.	mg/L	001G	12/31/2012

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Solids, total suspended	Daily Maximum	37.5	146.4	lb/d	001G	12/31/2012
Solids, total suspended	Weekly Average	33.	55.1	lb/d	001G	12/31/2012
Solids, settleable	Daily Maximum	1.	19.	mL/L	001G	12/31/2012
Total Ammonia Nitrogen	Weekly Average	2.4	3.25	mg/L	001G	12/31/2012
Total Ammonia Nitrogen	Daily Maximum	4.	6.5	mg/L	001G	12/31/2012
Total Ammonia Nitrogen	Daily Maximum	3.3	4.46	lb/d	001G	12/31/2012
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	21.2	lb/d	001G	12/31/2012
Solids, suspended percent removal	Monthly Avg. Min.	60.	54.4	%	001G	12/31/2012
Carbonaceous oxygen demand, % removal	Monthly Avg. Min.	75.	70.1	%	001G	12/31/2012
Solids, total suspended	Monthly Avg. Min.	30.	22.1	mg/L	001G	01/31/2013
Solids, total suspended	Daily Maximum	45.	106.	mg/L	001G	01/31/2013
Solids, total suspended	Monthly Average	25.	26.1	lb/d	001G	01/31/2013
Solids, total suspended	Daily Maximum	37.5	145.9	lb/d	001G	01/31/2013
Solids, total suspended	Weekly Average	33.	42.9	lb/d	001G	01/31/2013
Solids, settleable	Daily Maximum	1.	8.	mL/L	001G	01/31/2013
Total Ammonia Nitrogen	Weekly Average	2.4	2.57	mg/L	001G	01/31/2013
Total Ammonia Nitrogen	Daily Maximum	4.	6.94	mg/L	001G	01/31/2013
Total Ammonia Nitrogen	Monthly Average	1.6	2.2	lb/d	001G	01/31/2013
Total Ammonia Nitrogen	Daily Maximum	3.3	9.55	lb/d	001G	01/31/2013
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	27.5	lb/d	001G	01/31/2013
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	13.8	lb/d	001G	01/31/2013
Solids, suspended percent removal	Monthly Avg. Min.	60.	49.5	%	001G	01/31/2013
Solids, total suspended	Monthly Avg. Min.	30.	4.7	mg/L	001G	02/28/2013
Total Ammonia Nitrogen	Monthly Average	1.9	6.19	mg/L	001G	02/28/2013
Total Ammonia Nitrogen	Weekly Average	2.4	8.85	mg/L	001G	02/28/2013
Total Ammonia Nitrogen	Daily Maximum	4.	9.86	mg/L	001G	02/28/2013
Total Ammonia Nitrogen	Monthly Average	1.6	4.37	lb/d	001G	02/28/2013
Total Ammonia Nitrogen	Daily Maximum	3.3	7.15	lb/d	001G	02/28/2013
Total Ammonia Nitrogen	Weekly Average	2.	4.9	lb/d	001G	02/28/2013
E. coli, MTEC-MF	Daily Maximum	941.	1046.2	#/100mL	001G	02/28/2013
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	13.1	lb/d	001G	02/28/2013
Solids, total suspended	Monthly Avg. Min.	30.	4.5	mg/L	001G	03/31/2013
Total Ammonia Nitrogen	Monthly Average	1.9	3.3	mg/L	001G	03/31/2013
Total Ammonia Nitrogen	Weekly Average	2.4	10.3	mg/L	001G	03/31/2013
Total Ammonia Nitrogen	Daily Maximum	4.	12.3	mg/L	001G	03/31/2013
Total Ammonia Nitrogen	Monthly Average	1.6	2.44	lb/d	001G	03/31/2013
Total Ammonia Nitrogen	Daily Maximum	3.3	9.97	lb/d	001G	03/31/2013
Solids, total suspended	Monthly Avg. Min.	30.	5.2	mg/L	001G	04/30/2013
Total Ammonia Nitrogen	Monthly Average	1.9	2.72	mg/L	001G	04/30/2013
Total Ammonia Nitrogen	Weekly Average	2.4	2.72	mg/L	001G	04/30/2013

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Daily Maximum	4.	8.06	mg/L	001G	04/30/2013
Total Ammonia Nitrogen	Monthly Average	1.6	2.4	lb/d	001G	04/30/2013
Total Ammonia Nitrogen	Daily Maximum	3.3	7.27	lb/d	001G	04/30/2013
Total Ammonia Nitrogen	Weekly Average	2.	5.4	lb/d	001G	04/30/2013
Solids, total suspended	Monthly Avg. Min.	30.	14.3	mg/L	001G	05/31/2013
Solids, total suspended	Daily Maximum	37.5	46.5	lb/d	001G	05/31/2013
Solids, settleable	Daily Maximum	1.	15.	mL/L	001G	05/31/2013
Total Ammonia Nitrogen	Monthly Average	1.1	3.93	mg/L	001G	05/31/2013
Total Ammonia Nitrogen	Weekly Average	2.	3.22	mg/L	001G	05/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.5	3.93	mg/L	001G	05/31/2013
Total Ammonia Nitrogen	Monthly Average	.9	2.82	lb/d	001G	05/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.1	2.24	lb/d	001G	05/31/2013
Solids, suspended percent removal	Monthly Avg. Min.	60.	58.9	%	001G	05/31/2013
Solids, total suspended	Monthly Avg. Min.	30.	5.1	mg/L	001G	06/30/2013
Total Ammonia Nitrogen	Monthly Average	1.1	3.84	mg/L	001G	06/30/2013
Total Ammonia Nitrogen	Weekly Average	2.	5.4	mg/L	001G	06/30/2013
Total Ammonia Nitrogen	Daily Maximum	2.5	9.69	mg/L	001G	06/30/2013
Total Ammonia Nitrogen	Monthly Average	.9	2.27	lb/d	001G	06/30/2013
Total Ammonia Nitrogen	Daily Maximum	2.1	2.84	lb/d	001G	06/30/2013
Total Ammonia Nitrogen	Weekly Average	1.7	2.84	lb/d	001G	06/30/2013
Solids, total suspended	Monthly Avg. Min.	30.	9.5	mg/L	001G	07/31/2013
Solids, total suspended	Daily Maximum	37.5	56.4	lb/d	001G	07/31/2013
Solids, settleable	Daily Maximum	1.	2.	mL/L	001G	07/31/2013
Total Ammonia Nitrogen	Monthly Average	1.1	4.32	mg/L	001G	07/31/2013
Total Ammonia Nitrogen	Weekly Average	2.	3.88	mg/L	001G	07/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.5	12.38	mg/L	001G	07/31/2013
Total Ammonia Nitrogen	Monthly Average	.9	3.16	lb/d	001G	07/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.1	2.8	lb/d	001G	07/31/2013
Total Ammonia Nitrogen	Weekly Average	1.7	2.8	lb/d	001G	07/31/2013
E. coli, MTEC-MF	Daily Maximum	941.	2419.6	#/100mL	001G	07/31/2013
Solids, total suspended	Monthly Avg. Min.	30.	3.8	mg/L	001G	08/31/2013
Total Ammonia Nitrogen	Monthly Average	1.1	8.56	mg/L	001G	08/31/2013
Total Ammonia Nitrogen	Weekly Average	2.	8.98	mg/L	001G	08/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.5	19.5	mg/L	001G	08/31/2013
Total Ammonia Nitrogen	Monthly Average	.9	6.92	lb/d	001G	08/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.1	16.4	lb/d	001G	08/31/2013
Total Ammonia Nitrogen	Weekly Average	1.7	7.01	lb/d	001G	08/31/2013
E. coli, MTEC-MF	Daily Maximum	941.	1986.3	#/100mL	001G	08/31/2013
Solids, total suspended	Monthly Avg. Min.	30.	4.	mg/L	001G	09/30/2013
Total Ammonia Nitrogen	Monthly Average	1.1	14.42	mg/L	001G	09/30/2013
Total Ammonia Nitrogen	Weekly Average	2.	14.42	mg/L	001G	09/30/2013
Total Ammonia Nitrogen	Daily Maximum	2.5	22.1	mg/L	001G	09/30/2013
Total Ammonia Nitrogen	Monthly Average	.9	9.65	lb/d	001G	09/30/2013
Total Ammonia Nitrogen	Daily Maximum	2.1	14.7	lb/d	001G	09/30/2013

Parameter Description	Violation	Limit Value	DMR Value	Units	Outfall	Reporting Period
Total Ammonia Nitrogen	Weekly Average	1.7	9.65	lb/d	001G	09/30/2013
Solids, total suspended	Monthly Avg. Min.	30.	3.	mg/L	001G	10/31/2013
Total Ammonia Nitrogen	Monthly Average	1.1	14.2	mg/L	001G	10/31/2013
Total Ammonia Nitrogen	Weekly Average	2.	14.2	mg/L	001G	10/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.5	29.2	mg/L	001G	10/31/2013
Total Ammonia Nitrogen	Monthly Average	.9	9.7	lb/d	001G	10/31/2013
Total Ammonia Nitrogen	Daily Maximum	2.1	20.6	lb/d	001G	10/31/2013
Total Ammonia Nitrogen	Weekly Average	1.7	8.2	lb/d	001G	10/31/2013
Solids, total suspended	Weekly Average	40.	105.3	mg/L	001G	11/30/2013
Solids, total suspended	Daily Maximum	45.	378.5	mg/L	001G	11/30/2013
Solids, total suspended	Monthly Average	25.	100.4	lb/d	001G	11/30/2013
Solids, total suspended	Daily Maximum	37.5	419.2	lb/d	001G	11/30/2013
Solids, total suspended	Weekly Average	33.	294.8	lb/d	001G	11/30/2013
Solids, settleable	Daily Maximum	1.	70.	mL/L	001G	11/30/2013
Total Ammonia Nitrogen	Monthly Average	1.9	10.5	mg/L	001G	11/30/2013
Total Ammonia Nitrogen	Weekly Average	2.4	12.8	mg/L	001G	11/30/2013
Total Ammonia Nitrogen	Daily Maximum	4.	24.5	mg/L	001G	11/30/2013
Total Ammonia Nitrogen	Monthly Average	1.6	6.09	lb/d	001G	11/30/2013
Total Ammonia Nitrogen	Daily Maximum	3.3	20.73	lb/d	001G	11/30/2013
Total Ammonia Nitrogen	Weekly Average	2.	7.7	lb/d	001G	11/30/2013
E. coli, MTEC-MF	Daily Maximum	941.	1732.9	#/100mL	001G	11/30/2013
BOD, carbonaceous, 05 day, 20 C	Monthly Average	10.	11.2	mg/L	001G	11/30/2013
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	20.	21.1	mg/L	001G	11/30/2013
BOD, carbonaceous, 05 day, 20 C	Daily Maximum	16.7	24.2	lb/d	001G	11/30/2013
BOD, carbonaceous, 05 day, 20 C	Weekly Average	13.	19.2	lb/d	001G	11/30/2013
Solids, suspended percent removal	Monthly Avg. Min.	60.	41.6	%	001G	11/30/2013

ENCLOSURE C

RIGHT TO ASSERT BUSINESS CONFIDENTIALITY CLAIMS
(40 C.F.R. Part 2)

Except for effluent data, you may, if you desire, assert a business confidentiality claim as to any or all of the information that the EPA is requesting from you. The EPA regulation relating to business confidentiality claims is found at 40 C.F.R. Part 2.

If you assert such a claim for the requested information, the EPA will only disclose the information to the extent and under the procedures set out in the cited regulations. If no business confidentiality claim accompanies the information, the EPA may make the information available to the public without any further notice to you.

40 C.F.R. § 2.203(b). Method and time of asserting business confidentiality claim. A business which is submitting information to the EPA may assert a business confidentiality claim covering the information by placing on (or attaching to) the information, at the time it is submitted to the EPA, a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as trade secret, proprietary, or company confidential. Allegedly confidential portions of otherwise non-confidential documents should be clearly identified by the business, and may be submitted separately to facilitate identification and handling by the EPA. If the business desires confidential treatment only until a certain date or until the occurrence of a certain event, the notice should so state.

United States Environmental Protection Agency
Region 4
Science and Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605-2720

Diagnostic Evaluation Report

City of Cornersville Sewage Treatment Plant
Cornersville, Tennessee
Inspection Date: May 6-7, 2013
NPDES Permit No. TN0061841
SESD Project ID No. 13-0346

Requestor: Maurice Horsey, Chief
Municipal and Industrial Enforcement Section
Water Protection Division
U.S.EPA Region 4
Forsyth St. SW
Atlanta, Georgia 30303-8960

SESD Project Leader: Jairo Castillo, P.E.
Environmental Engineer
Enforcement Section
U.S. EPA Region 4
980 College Station Road
Athens, Georgia 30605-2720

Title and Approval Sheet

Title: Diagnostic Evaluation Inspection Report
City of Cornersville Sewage Treatment Plant (STP)

Approving Official:

M Bowden

Mike Bowden, Chief
Enforcement Section
Enforcement and Investigations Branch

9/20/13
Date

SESD Project Leader:

Jairo Castillo

Jairo Castillo, PE, Environmental Engineer
Enforcement Section
Enforcement and Investigations Branch

9/20/13
Date

TABLE OF CONTENTS

List of Tables:

List of Figures:

Diagnostic Evaluation Report
City of Cornersville Sewage Treatment Plant
Cornersville, Tennessee- No. TN0061841

EXECUTIVE SUMMARY

During the week of May 6, 2013, representatives of the U.S. Environmental Protection Agency, Science and Ecosystem Support Division (USEPA-SESD), conducted a Diagnostic Evaluation at the Cornersville Sewage Treatment Plant (STP) in Cornersville, Tennessee. The purpose of the study was to assess the overall operation of the Cornersville STP. The facility is a 0.1 MGD that serves residential communities and commercial properties. The plant was built in 1990 and consists of one 1.2 million gallon equalization tank with three mechanical aerators, followed by two sequencing batch reactors (SBRs) tanks, an ultraviolet (UV) disinfection system, and an effluent cascade aerator channel that discharges into Town Creek (See Figure 1). Plant Discharge Monitoring Reports (DMRs) indicated numerous violations for ammonia -nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), *E. coli*, and settleable solids during 2012 and 2013. At the time of inspection, the facility was operating in storm mode due to a severe rain event that occurred within 48 hrs before the inspection. This report provides a description of the evaluation, including findings and recommendations of the inspection.

The diagnostic evaluation included the following tasks:

- Assessing the design, operations and management factors limiting treatment performance.
- Review of operations and management of the wastewater treatment plant.
- Characterization of the influent raw wastewater and final effluent.
- Evaluation of the unit processes performance via visual observations, sampling, data review, and process control testing.
- Determination of unit process operating parameters (e.g. Mean cell residence time, F/M, etc.).
- Evaluation of the NPDES self-monitoring program including sampling, flow measurement, records and reports, and laboratory procedures.

The major findings were as follows:

- The Cornersville STP aeration basin was operating with a mixed liquor suspended solids (MLSS) of 4,300 mg/l. This value was at the higher end of the recommended range (2000 to 5,000 mg/l) of MLSS in an SBR. The MCRT was 43 days. The MCRT exceeded the recommended value for optimal biological activity (up to 30 days) because of the high solids content in the SBR in relation to the amount of sludge wasted. The F/M value was 0.02 lbs BOD/day/lbs MLVSS, which was below the recommended range for proper $CBOD_5$ and ammonia as nitrogen removal (0.04 to 0.10 lbs BOD/day/lbs MLVSS).
- Low DO concentrations were found in the SBR react cycle. DO concentrations ranged from 0.28 to 1.15 mg/l.

- DMRs from 2012 and 2013 revealed numerous permit violations for ammonia-nitrogen, $CBOD_5$, TSS, *E. coli*, and Settleable Solids.
- Rising sludge was observed in the settlometer test due to denitrification. Low DO concentrations in the SBRs react cycle may result in dentrification during the decant cycle. .
- The facility manually applied sodium bicarbonate to add alkalinity to the SBR biomass to control the pH. The average pH of the activated sludge from several instantaneous readings was 7. Slime and solids accumulation were observed on the UV lamp's surface. Slime buildup in the UV lamps and high suspended solids concentrations in wastewater adversely affect the UV system disinfection efficiency.
- The flow data observed on the DMRs shows that of the last fifteen months (Jan-2012 through Mar-2013), the effluent flow equaled or exceeded the design capacity of the plant (0.100 MGD) for five months. For the months of January and February, 2012, the average effluent flows were 0.108 mgd and 0.105 mgd, respectively. For the months of January and March, 2013, the average flows were 0.131 mgd and 0.098 mgd, respectively.
- An EPA instantaneous flow meter check revealed that the secondary flow meter measured 25 percent below the instantaneous flow measured at the primary device (Parshall flume), which exceeded the EPA accepted accuracy range of ±10 percent.
- Solids buildup was observed on the discharge channel and the Parshall flume crest.
- No preliminary treatment was observed at the plant.
- The equalization tank was observed near to exceeding capacity. The tank overflows during severe rain events.
- The influent composite sampler tubing was clogged
- The influent automatic sampler was located after the equalization tank.
- The pH 7 buffer solution used for instrument calibration exceeded the expiration date (January, 2013).
- Transcription errors were observed in the 2012 and 2013 DMRs.

Recommendations:

- The Cornersville STP staff should focus on monitoring key operating parameters (MCRT, F/M, MLSS, sludge age) on a daily basis, interpret the data in relation to the effluent quality and sludge settleability, and conduct the necessary adjustments to meet the limits of the NPDES permit, specifically for $CBOD_5$, TSS, settleable solids, ammonia-nitrogen, and *E. coli* Bacteria. The solids inventory should be gradually reduced to obtain an MCRT that provides for adequate $CBOD_5$ removal and nitrification, as well as good settling characteristics. This will also bring the F/M ratio up, keeping the biological process more balanced and in an acceptable range of 0.4 to 0.10 lbs BOD/day-lbs MLVSS.
- Minimum concentrations of 1 to 3 mg/l are required in the SBR fill/react cycle to provide an optimal biological activity for $CBOD_5$ and ammonia-nitrogen biological removal. In addition, the F/M ratio of 0.02 should be increased to the acceptable range by carefully increasing sludge wasting until the treatment process improves.

- The permittee should consider installing an automatic lime or sodium bicarbonate feeders and pH probes in the SBRs units in order to maintain the activated sludge in the target range of 7.5 to 9.0 standard units.
- The solids inventory should be gradually reduced to obtain an MCRT that provides for adequate $CBOD_5$ removal and proper nitrification, as well as good settling characteristics.
- The permittee needs to provide proper maintenance (cleaning) to the UV system to improve the system operation and comply with the limits of the NPDES permit for E.Coli.
- The SBR process control testing should be increased to provide for optimal treatment. The following process control tests should be conducted regularly: aeration basin DO profile, Settlometer test, aeration basin pH, microscopic examination, and F/M calculations.
- The effluent secondary flow meter should be recalibrated to achieve accurate readings to within the EPA accepted accuracy range of +/- 10 percent. The upstream channel in the flume needs to be cleaned and properly maintained.
- The permittee should monitor the average influent flow of the plant to identify if the plant exceeds the 85 percent of the plant's design criteria on an average annual basis based on the previous twelve months of data. If the 85 percent of design criteria is exceeded, the permittee should provide a schedule to expand the plant's capacity to begin within one year of the exceedance.
- The permittee should consider the installation of a preliminary treatment process, such as screening and grit removal to reduce the inorganic solids in the equalization tank and subsequent units.
- The equalization tank should be evaluated for a potential accumulation of solids that could reduce its capacity. Additionally, the permittee should also assess the city's sewer system to detect potential infiltration problems that appear to increase the influent flow of the plant during rain events.
- The influent automatic sampler should be moved upstream of the equalization basin and should be properly maintained. The intake line should be checked regularly for rags and other debris that can cause clogging problems. Or, the line should be moved or repositioned in a location where rags and debris are not a problem.
- The permittee should assess the SBR diffuser system performance and operation including the blower capacity to determine if the system has the capability of increasing the air supply needed for the SBRs treatment process. A gradual reduction in the MLSS should result in lower oxygen requirements in the reactor.
- The SBR total cycle time should be increased to approximately five hours (from 4.35 hours) to provide the required time for proper nitrification (CSU, 2008).
- Transcription errors on the DMRs should be corrected and can be prevented with an in-house quality assurance/quality control process. DMRs should be routinely cross-checked and reviewed to avoid future errors.
- Additional O&M training for the staff would improve plant operations.

1. INTRODUCTION

During the week of May 6, 2013, representatives of the U.S. Environmental Protection Agency, Science and Ecosystem Support Division (USEPA – SESD), conducted a Diagnostic Evaluation (DE) at the City of Cornersville Sewage Treatment Plant (STP) at 1880 Ostella Rd Cornersville, Tennessee. The DE was performed at the request of the EPA Region 4 Water Protection Division, as the permittee has had difficulty meeting their NPDES permit limits.

The following personnel participated in the Diagnostic Evaluation:

Name	Organization	Telephone
Jairo Castillo	USEPA–SESD, Inspector	(706) 355-8621
John L. Williams	USEPA–SESD, Inspector	(706) 355-8735
Bill Simpson	USEPA–SESD, Inspector	706) 355-8748
Dewitt Logsdon	TDEC, Inspector	(931) 490-3940
Kent Sweeton	Water and Wastewater Supervisor	(931) 359-6831
Denise Massey	Operator	(931) 359-2363

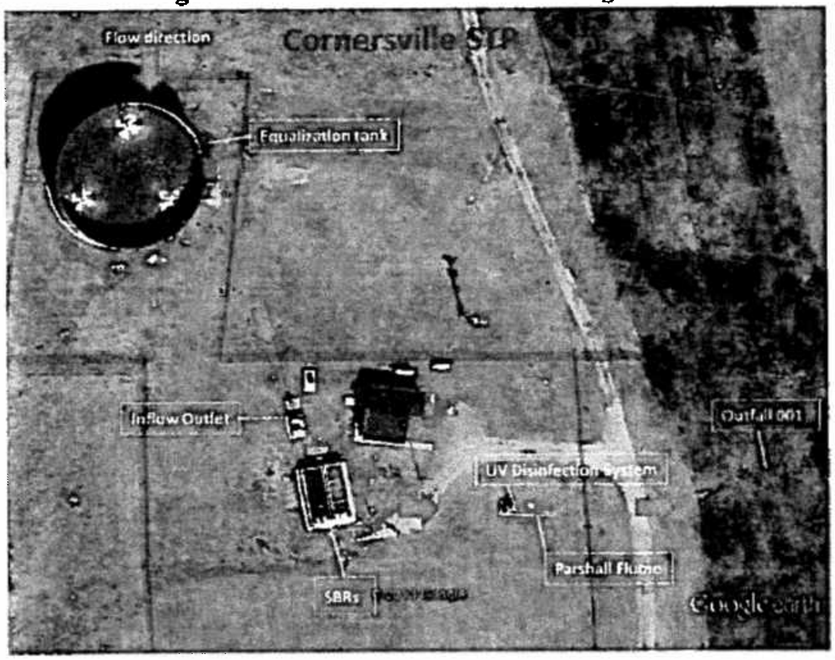
2. BACKGROUND

The City of Cornersville is in Marshall County Tennessee, approximately sixty miles south of Nashville. Since 2007, the City of Lewisburg, located approximately 6 miles north of Cornersville, owns and operates the plant through its Water and Wastewater Treatment Program. The community has a population of approximately 1,194 people. The Cornersville STP is a 0.1 MGD that serves residential communities and commercial properties. Previous Discharge Monitoring Reports (DMRs) indicated numerous violations for ammonia- nitrogen, $CBOD_5$, total suspended solids (TSS), *E. coli*, and settleable solids during 2012 and 2013. The recommendations in this report address the current plant as configured.

3. FACILITY SITE REVIEW

The Cornersville STP is a 0.1 MGD municipal wastewater treatment plant in Cornersville, TN. The plant was built in 1990. The plant operates 24 hours per day, 365 days per year and consists of a one 1.2 million gallon equalization tank with three mechanical aerators, followed by two sequencing batch reactors (SBRs) tanks in, and UV disinfection system. The sludge generated from the plant was treated in the Lewisburg Wastewater Treatment Plant. Figure 1 shows the facility's treatment processes and direction of the flow.

Figure 1: *Cornersville STP Flow Diagram*



3.1. Permit

The Cornersville STP is authorized to discharge under the permit No. TN0061841. The NPDES permit issued by the Tennessee DEC, became effective on January 1, 2013 and expires on November 30, 2017. The name and description of the facility, the location of the outfall and the name of the receiving waters were as described in the permit.

3.2. Records and Reports

Self monitoring records consisted of the following:

- Discharge monitoring reports (DMRs)
- Monthly operating reports (MORs)
- Laboratory bench sheets
- Daily operational sheets
- Calibration records

The self monitoring records were kept for a minimum of three years. The permittee's self monitoring data for 2012 and 2013 are shown in Tables 1, 2, and 3. Numbers highlighted in "Red" and shaded indicate effluent violation of a listed permit parameter.

Deficiencies:

- Discharge Monitoring Reports (DMRs) indicated numerous violations for ammonia as nitrogen, total suspended solids (TSS), *E. coli*, and settleable solids on 2012 and 2013.
- Transcription errors were found in the spreadsheets and discharge monitoring reports were not

consistent with NPDES self-monitoring requirements regarding sampling documentation and reporting of parameter concentrations and loadings. The correct spreadsheet cell was not used for calculating the weekly average value. The spreadsheet cell was referenced to the ammonia daily maximum value (lbs/d) instead of the weekly average value.

Regulatory Requirement: 40CFR part 122.41 (a) (1) Duty to comply. The permittee shall comply with effluent standards or prohibitions established under section 307 (a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405 (d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

Regulatory Requirement: 40CFR part 122.41 (l) (4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

Suggestion: Peer review should be conducted before submitting the DMRs to ensure accuracy in reporting.

Table 1: ***Cornersville STP Self Monitoring Data (DMRs 2012-2013)-Solids***

	Flow (mgd)	Inf. CBOD$_5$- (mg/L)	Eff. CBOD$_5$ (mg/l)			CBOD$_5$- Percent Removal	Eff. CBOD$_5$ (lb/d)		
		MA	MA	WA	DM	MA	MA	WA	DM
Permit Limit	H or	Report	10	15	20	75	8	13	16.7
Jan-2012	0.108	49.4	4.63	4.6	17.6	89	4.23	4.2	17.60
Feb-2012	0.105	37.7	3.23	3.2	4.4	92	2.82	2.8	3.9
Mar-2012	0.099	67.3	5.2	5.1	9.9	92	4.0	4.1	7.0
Apr-2012	0.062	127.0	6.7	6.7	14.8	94.7	3.4	5.8	8.7
May-2012	0.062	116.2	5.78	5.9	18.8	94.9	2.75	2.8	8
Jun-2012	0.057	112.9	3.89	3.41	6.9	97.1	1.71	1.8	3
Jul-2012	0.066	123.0	3.5	3.5	4.5	97.1	1.86	1.9	4
Aug-2012	0.058	105.7	5.5	8.4	8.4	94.7	2.39	2.5	4
Oct-2012	0.073	70.2	5.04	5.2	14.1	92.2	3.0	3.1	10
Nov-2012	0.052	114.9	8.4	8.3	19.5	92.3	3.6	8.0	8.5
Dec-2012	0.086	40.6	6.7	9.1	17.8	83	5.3	8.9	21.2
Jan-2013	0.131	32.7	6.6	5.7	20	81.3	7.7	13.8	27.5
Feb-2013	0.086	91.5	4.1	6.5	6.5	96.5	2.1	13.1	4.6
Mar-2013	0.098	61.7	2.8	3.0	5.3	94.2	2.3	3.2	4.7

Note: DM= Daily Maximum; MA= Monthly Average; WA= Weekly Average, No data provided for the month of Sept, 2012.

Table 2: ***Cornersville STP Self Monitoring Data (DMRs 2012-2013)-Bacteria and Solids***

	E. Coli (#/100mL)		Inf *TSS (mg/l)	Effluent TSS (mg/l)			TSS *Percent Removal	Effluent TSS (lb/d)		
	DM	Mean GM	MA	MA	WA	DM	MA	MA	WA	DM
Permit Limit	941	126	-	30	40	45	60	25	33	37.6
Jan-2012	866.4	7	49	8.9	8.9	55.0	89.6	8.3	24.5	55.1
Feb-2012	34	4	62	6.1	5.7	10.5	90.5	5.4	7.3	9.6
Mar-2012	78	7	82	11.4	11.4	19.0	86.2	8.9	11.0	12.4
Apr-2012	14	193.50	86	7.4	7.4	12.0	90.8	3.7	4.8	7.0
May-2012	363	2,419	178	7.4	5.4	33.0	91.2	7.93	3.4	14.6
Jun-2012	549	2420	87	6.0	7.8	12.88	96.0	6.0	7.8	9.0
Jul-2012	315	1986	105	3.9	3.9	6.0	96.0	2.0	2.3	4.0
Aug-2012	630	2419.6	77	9.1	9.9	33.0	87.2	4.3	8.6	16.8
Oct-2012	1336	2420	50	21.2	22.2	73.0	71.0	12.8	32.7	44.6
Nov-2012	1284	2419.6	74	41.8	40.7	146.0	68.9	8.1	54.9	66.5
Dec-2012	8	65.30	70	27.3	46.9	123.0	54.1	23.7	55.1	146.4
Jan-2013	33	139.60	39	22.1	16.1	106.0	49.5	26.1	42.9	145.9
Feb-2013	29	1046.20	86	4.7	5.1	12.5	94.0	3.4	11.5	8.8
Mar-2013	7	25.90	69	4.5	5.0	8.0	92.4	3.8	6.4	6.9

Note DM= Daily Maximum, MA= Monthly Average, WA= Weekly Average; No data provided for the month of Sept, 2012. Influent Samples were collected after the equalization basin and do not reflect raw influent versus final effluent percent removals.

Table 3: ***Cornersville STP Self Monitoring Data (DMRs 2012-2013)-DO, pH, Solids, Nutrients***

	Eff. DO (mg/l)	pH (S.U)	Settleable solids (ml/L)	Ammonia (NH_3) as N (mg/L)			Ammonia (NH_3) as N (lb/d))*			P (mg/L)
				MA	WA	DM	MA	WA	DM	
Permit Limit	Min 6	6-9	1	1.1/1.7	2/2.4	2.7/4.0	0.9/1.6	1.7/2.0	2.1/3.3	Report
Jan-2012	9.3	6.9/7.6	16.00	2.6	5.13	11.14	2.09	2.1	9.60	0.00
Feb-2012	9.6	7.2/7.8	7	0.22	0.5	1.29	0.2	0.5	1.5	0.00
Mar-2012	9.2	7.5/7.9	BDL	8.70	20.65	23.13	6.30	6.1	21.07	0.00
Apr-2012	7.7	7.0/7.9	BDL	14.60	21.91	25.42	7.48	7.5	14.3	0.00
May-2012	8.9	7.3/7.9	3	7.93	8.77	25.87	16.39	8.77	12.77	3.65
Jun-2012	8	6.8/7.7	0.40	2.91	2.91	2.91	4.53	4.55	12.8	6.25
Jul-2012	9.0	7.3/7.8	0.30	5.92	5.92	9.07	3.24	3.24	3.24	3.35
Aug-2012	9.2	7.5/7.9	2.0	3.47	3.92	6.83	1.68	1.44	1.44	6.90
Oct-2012	7.4	7.4/7.9	2.50	2.07	2.15	8.57	1.31	1.38	1.38	3.35
Nov-2012	9.0	6.9/7.8	19.50	0.98	2.10	3.19	0.42	0.4	1.35	0.00
Dec-2012	8.1	7.4/8.0	19.0	0.93	3.25	6.58	0.61	0.7	4.46	0.00
Jan-2013	9.9	7.4/7.7	3.0	1.81	2.57	6.94	2.20	1.3	9.55	0.00
Feb-2013	10.2	7.2/7.8	1.0	6.19	8.85	9.86	4.37	4.9	7.15	1.70
Mar-2013	10.3	7.4/7.7	BDL	3.30	10.30	12.30	2.44	2.0	9.97	0.00

*Error transcription in spreadsheet

Note DM= Daily Maximum, MA= Monthly Average; WA= Weekly Average. No data provided for the month of Sept, 2012 Ammonia limits for Summer: Oct-April/Winter: Nov-May)

3.3. Flow Measurement

The facility's influent flow was measured by an electromagnetic inline flow meter (MCCRO). The effluent flow was measured with a 6-inch Parshall flume and a secondary flow meter (STI 345 Magnetrol), which included a chart recorder and totalizer. The secondary flow meter was used for permit reporting. The effluent meter was last calibrated in February, 2013. Table 4 describes the results of the EPA check of the secondary flow measurement device for accuracy.

Table 4: ***Flow Measurement***

Flow Device	Size	Instantaneous Head	Flow (gpm)	Error
Effluent Parshall Flume	6-in	0.6	412.5	25%
Plant Secondary Flow Meter	-	0.5	309.2	

Note: Eleven (11) sequencing discharges per day, 30 min duration

The EPA used a Teledyne ISCO Ultrasonic Flowmeter to measure the effluent flow to collect a flow proportional 24-hour composite sample. The EPA effluent flow was 0.185 mgd. During the same period, the effluent flow of the plant was 0.170 mgd; an 8.1 percent difference compared to the EPA flow value. In addition, the EPA effluent flow was 85 percent higher than the design flow of the treatment plant.

Solids buildup was observed in the effluent trough and in the Parshall flume crest. The solids accumulation in the Parshall flume crest appears to affect the accuracy of flow measurement, thus generating a reading difference of 25 percent between the primary and secondary flow measuring devices.

The flow data observed on the DMRs shows that for the last fifteen months (Jan-2012 through Mar-2013), the average monthly effluent flow equals or exceeds the design capacity of the plant (0.100 MGD) in five months. For the months of January and February, 2012, the monthly average effluent flows were 0.108 mgd and 0.105 mgd, respectively. For the months of January and March, 2013, the average flows were 0.131 mgd and 0.098 mgd, respectively. These values exceeded the 85 percent of the plant design criteria.

<u>**Deficiencies:**</u>

- The permit requires that the sample collection and flow readings should be conducted at the same time for loading calculations purposes. The plant was collecting the 24-hour flow reading with an eight hours lag (8:00am) from the time of collection of the 24-hour composite sample (4:00pm).
- An EPA instantaneous calibration check for the flow meter at outfall 001 indicated that the meter was recording 25 percent less than the actual flow, thus exceeding the ±10 percent threshold.

Regulatory Requirements: 40 CFR, Part 122.41, (e), Proper Operation and Maintenance: The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control and related appurtenances which are installed or used by the permittee to achieve compliance with the conditions of this permit (40 CFR, Part 122.41, (e)). The permittee shall obtain accurate wastewater flow data to calculate mass loading (quantity) from measured concentrations of pollutants discharged as required by its NPDES permit. 40CFR part 122.41 (j) (1), Monitoring and Records states that samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The difference between two stable flow totalizer readings (flow is steady for 10 minutes or more) should not exceed ±10 percent of the instantaneous flow measured at the primary device (*NPDES Compliance Inspection Manual, EPA, 2004*).

Suggestion: The Cornersville STP Operators should provide regular maintenance and cleaning of the effluent trough and check flow meter calibration on a daily basis.

3.4. Operations and Maintenance

The plant was operated and maintained by two certified operators, Mr. Kent Sweeton and Mrs. Denise Massey. The plant is staffed eight hours per day, five days per week and several hours on weekends. Maintenance activities were performed by the staff as needed. Laboratory equipment, such as the analytical balance, pH meter, and DO meter were observed in good condition. $CBOD_5$, *E. coli*, nutrients, TSS, and settleable solids analyses were performed at the Lewisburg Wastewater Treatment Plant laboratory.

Deficiencies:

- At the time of the inspection, the 1.2 MG equalization tank was near to exceeding capacity (Photo 4, page 29). The operator stated that the previous week the tank overflowed.
- The UV lamps did not appear to be clean.

Regulatory Requirement: 40 CFR, Part 122.41, (e), Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control and related appurtenances which are installed or used by the permittee to achieve compliance with the conditions of this permit (40 CFR, Part 122.41, (e)).

Suggestion: The city of Cornersville should evaluate the city sewer system for infiltration problems. A maintenance schedule is recommended to reduce the build up of grit and other materials in the bottom of the equalization tank. Ultimately, preliminary treatment processes including screening and grit removal should be installed at the head of the plant.

3.5. Sludge Disposal

The plant transports approximately 3,500 gallons of waste sludge every week in two 1,800 gallon truck tanks to the Lewisburg wastewater treatment plant. There, the sludge was treated in an aerobic digester tank, dewatered by a filter belt press and then disposed in a landfill.

4. SAMPLING

The permittee collected the required samples according to the sampling frequencies and sample types described in the NPDES permit. Influent flow proportional composite samples were collected for analyses of $CBOD_5$, TSS, total nitrogen, and total phosphorus using an ISCO 4700 automatic composite sampler. The influent sample was collected after the equalization tank.

Effluent flow proportional composite samples were collected with an ISCO 4700 automatic sampler and the tubing was installed at the discharge channel. The sample was set to collect approximately 200 ml sample aliquots. Samples for Outfall 001 were analyzed for total suspended solids (TSS), settleable solids, ammonia as N, total phosphorus, and carbonaceous biochemical oxygen demand ($CBOD_5$), at various frequencies. The permit monitoring requirements for ammonia varied depending of the season of the year (summer and winter).

Effluent grab samples were collected for pH, and dissolved oxygen (DO). A grab sample for *E. coli* was collected after the UV contact chamber. Samples were collected in accordance with the requirements specified in the NPDES Permit. The following table summarizes the NPDES permit sampling scheme for outfall 001:

Table 5: ***Permit Self-Monitoring Requirements***

Parameters	**Unit**	**Type**	**Frequency**
Flow	MGD	Continuous	Daily
CBOD5	mg/l	24-hr Composite	Three per Week
TSS	mg/l	Composite	Three per week
E. coli (Fecal)	Count/100ml	Grab	Three per Week
Total Nitrogen (N)	mg/l	Composite	Twice per Month
Ammonia (as N)	mg/l	Composite	Three per Week
T. Phosphorus	mg/l	Composite	Monthly
DO	mg/l	Grab	Five per Week
Settleable solids	ml/l	Composite	Five per Week
pH	SU	Grab	Five per Week

Deficiency:

- The pH 7 buffer solution exceeded the expiration date (January, 2013).

Regulatory requirement: Calibration of continuous monitoring pH meters should be carried out at least daily against fresh buffers (minimum of two points) that bracket the expected sample pH and are approximately three pH units apart. (40 CFR, 136, Standard Methods, Method 4500-H^+ B, 20th Edition, and EPA Methods, Method 150.1).

Deficiencies:

- The influent composite sampler tubing was clogged (Photo 5, page 30).
- The influent composite sampler was located after the equalization tank. Influent samples were collected after the equalization basin and do not reflect raw influent versus final effluent percent removals.

Regulatory Requirement: 40CFR part 122.41 (j) (1), Monitoring and Records: Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The influent automatic sampler should be properly maintained. The intake line should be checked regularly for rags and other debris that can cause clogging problems. Or, the line should be moved or repositioned in a location where rags and debris are not a problem. The influent automatic sampler should be moved to the raw influent pump station to collect a more representative sample of the raw influent coming into the plant.

4.1. Evaluation of Influent Data Results

The pollutant loadings and major processes were assessed. The strength of the influent wastewater for BOD5, nitrate-nitrite, total phosphorous, and Total Kjeldahl Nitrogen (TKN) was lower than the typical values. Table 6 shows a comparison of USEPA influent analytical results and typical influent wastewater concentrations. It's important to note that the sampling event was conducted when the plant was operated in storm mode, with a daily average discharge of 0.185 MGD. The facility's average flow is approximately 0.08 MGD.

Table 6: ***Comparison of Influent Results with Typical Values***

Parameter	Typical Value*			City of Cornersville Influent EPA Result
	Low	Medium	High	
BOD_5 (mg/L)	110	190	350	40 A
TSS (mg/L)	120	210	400	20
TKN (mg/L)	20	41	70	14
Ammonia (mg/L)	12	25	45	14
Nitrate +nitrite (mg/L)	0	0	0	0.30
Total Phosphorus (mg/L)	4	7	12	1.0

* *Wastewater Engineering: Treatment and Reuse 4th edition*, Metcalf& Eddy, 2003. McGraw- Hill Companies, Inc. NYC[3]

4.1.1. USEPA Samples Results

The sampling event was conducted in accordance with the EPA Quality Assurance Project Plan for the City of Cornersville Sewage Treatment Plant, May 5, 2013. Sampling was conducted when the plant was running in storm mode because of raining events that took place in the previous week. Samples of the influent were collected at the influent 4" pipe (Photo 6, page 30). The influent sample was collected from the plant automatic sampler (ISCO 4700) as a split sample. Solids samples were collected in the sequencing batch reactor tank during the react (aeration) cycle. The *E. coli* and composite effluent samples were collected after the ultraviolet violet disinfection system. Figure 2 shows the locations of the wastewater samples collected during this evaluation. Influent and Effluent composite samples were split between EPA and the permittee, and a side by side comparison of facility and EPA analytical results was performed (Table 7). The results indicated satisfactory agreement between laboratories. See Attachment 5, SESD Final Analytical Results for a complete listing of analytical data. At the time of the inspection the daily average effluent flow was 0.185 mgd. The NPDES permit of the plant was approved for a treatment facility with a design capacity of 0.1 mgd, thus exceeding the permit by 85 percent.

Figure 2: ***USEPA Sampling Locations***

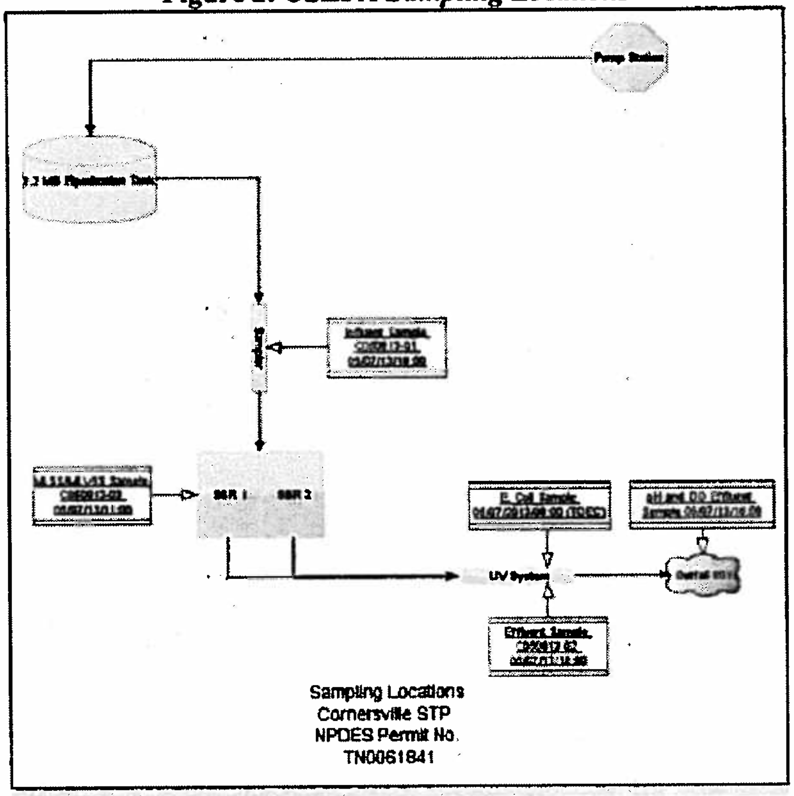


Table 7: ***USEPA and POTW Sampling Results (24 hour Composite)***

Parameter	EPA Inf, mg/l	POTW Inf. mg/l	EPA Eff. mg/l	POTW Eff. mg/l	EPA Eff. lb/d*	POTW Eff. lb/d**	Removal Efficiency
$CBOD_5$	40	30.9	5.3	3.33	8.2	4.72	87%
TSS	20	22	8.1	8.0	12.5	11.34	60%
Ammonia, as N	14	12.93	0.37	0.1	0.57	0.14	97%
TKN, mg/l	14	-	1.4	-	2.2	-	90%
Nitrate +nitrite, mg/l	0.30	-	9.1	-	14.0	-	-
Total P, mg/l	2.0	-	1.7	-	2.6	-	-
Settleable Solids, mL/l	-	-	0.50	0.1	-		None
E. Coli, mpn /100ml	-	-	4***	3	-	-	None
DO, mg/l	-	-	10.7	11.0	-		
pH, S.U.	-	-	7.21	7.64	-		None

Note: *USEPA Flow= 0.185 MGD was used to calculate the effluent loading (typical storm mode flow)
**POTW Flow=0.170 MGD was used to calculate the effluent pollutant loading
***E. Coli sample was analyzed by the TDEC Nashville Laboratory.

4.2. USEPA Sampling Methodology

All dissolved oxygen measurements were taken using YSI ® 550A Dissolved oxygen meter. pH was measured using an Orion pH meter. Flow measurement was checked at the effluent channel. All EPA sampling methods, measurements, and calibration were conducted in accordance with the following USEPA, Region 4, SESD procedures:

- Field Measurement of Dissolved Oxygen (SESDPROC-106-R2)
- Field pH Measurement (SEDPROC-100-R3)
- Wastewater Flow Measurement (SEDPROC-109-R3)
- Waste Water Sampling (SESDPROC-306-R3)
- *In-situ* Water Quality Monitoring (SESDPROC111-R3)
- Global Positioning System (SESDPROC-110-R3)
- Field Equipment Cleaning and Decontamination (SESDPROC-205-R2)

All EPA analyses, except *E. coli*, were conducted in accordance with the Analytical Support Branch Laboratory Operations and Quality Assurance Manual, February 15, 2013. The *E. coli* analysis was conducted by the Tennessee Department of Environmental Conservation (TDEC) Laboratory.

5. FACILITY DESIGN, OPERATION, AND PROCESS CONTROL ANALYSIS

The following sections described the evaluation of the unit processes performance and operation and discussion of the process control testing and operating parameters.

5.1. Preliminary Treatment

The SBR process is usually preceded by some type of preliminary treatment such as screening, communition or grit removal. The Cornersville STP does not have a preliminary treatment system. The plant operator stated that most of the influent comes from residential septic tanks that provide some sort of preliminary settling. However, commercial facilities that discharge their sanitary sewer did not provide any pre-treatment. The absence of a preliminary treatment may generate an accumulation of grit in the SBR tanks and create excessive wear of mechanical equipment due to the highly abrasive nature of grit and other materials.

5.2. Sequencing Batch Reactor Design and Operation

Each sequencing batch reactor has a volume of 4,719 ft^3 and a depth of 13 ft in each tank (Photos 1 and 2, page 28). The SBRs process cycles are operated by a programmable logic controller (PLC). The facility's total cycle time is approximately 4 hours. Table 8 shows the Cornersville STP total SBRs cycle times and the total cycle time for an SBR with CBOD, suspended solids removal and nitrification.

Table 8: *SBRs Cycle Times*

SBR	Fill Mixed/ React (min)	Settle (min)	Decant (min)	Idle (min)	Total Cycle Time (Hrs)
Cornersville STP Normal Mode	131	63	66	1	4.35
Cornersville STP Storm Mode	85	19	64	1	2.81
SBR with Nitrification, BOD, TSS (recommended)*	180	60	60 (may vary)	1 (Variable, determined by flow rate)	5

**SBRs for Nitrification and Nutrient Removal.* U.S.EPA 832- R-92-002, September, 1992.

The permittee should evaluate increasing the total cycle time (fill, react, settle, and idle) to five hours and assess the ammonia-nitrogen removal efficiency of the system. For nitrification, the fill/react time cycle should be last three hours, including a react time of at least one hour (CSU, 2008). The following evaluations were conducted:

- Process control testing was performed to assess the quality of the mixed liquor in the biological process of the activated sludge. The following tests were performed for this evaluation: settlometer test, dissolved oxygen profile of the SBR tanks, microscopic examination and blanket depth measurement.
- Unit process operating parameters were also calculated to determine if the hydraulic and organic loadings were within the recommended range of operation and design for an SBR unit.

Table 9 includes a summary of the evaluation results.

Table 9: *SBRs-Process Control Summary Results*

Aeration Basin Parameters	EPA Results	POTW Results	POTW March Average	SBR Recommended Range	Comments
Aeration Volume, MG	0.07	0.07	0.07	SBR volume 1.2 to 2.0 times the daily flow*	Average flow is 0.08MGD
Number of SBR Cycles per day	-	-	5 cycles in SBR 1 and 6 cycles at SBR 2	2 to 6 cycles per day*	Normal
SSV_{30}	350	-	-	-	Normal Settling
SSV_{30} Diluted	200	-	-	-	Rapid Settling, check MLSS
Hydraulic Detention Time, hrs	18	-	-	15-40**	Normal
Sludge Blanket depth, ft	7	-	-	Tanks are 13 ft depth each	High
MLSS, mg/l	4,300	-	4,937	2,000-5,000*	Within the higher range
Mixed Liquor Volatile Suspended Solids (MLVSS), mg/l	3,800	-	-	Greater than 80% of the total MLSS	88%

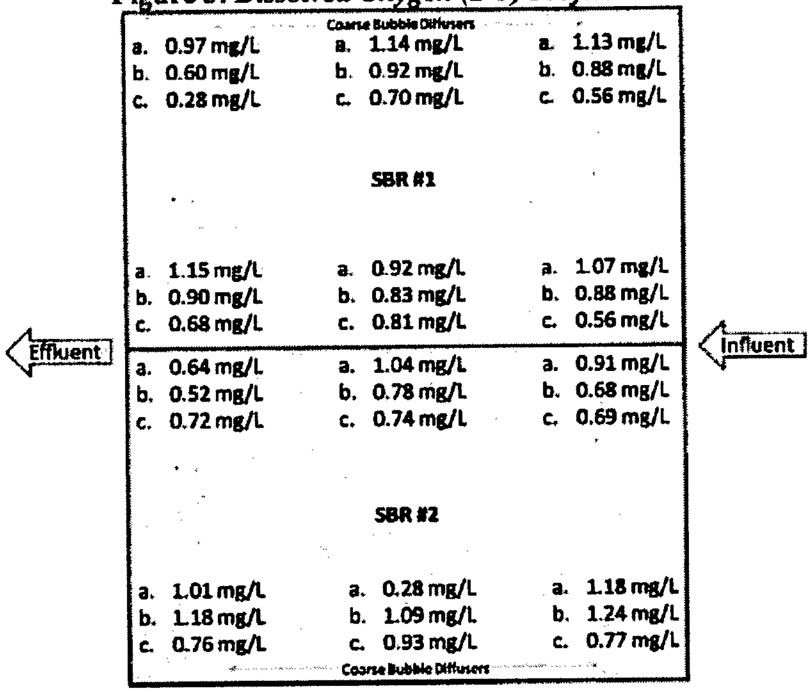
Aeration Basin Parameters	EPA Results	POTW Results	POTW March Average	SBR Recommended Range	Comments
DO in Aeration tank during React Cycle	0.28 to 1.15 mg/l	-	-	1.0-3.0 mg/l*	Low DO. For nitrification DO is 2.0 mg/l
Sludge Age, days	81	80	51	25 to 45*	Exceeded the range
F/M Ratio, lb BOD/day/lb MLVSS	0.03	0.02	0.02	0.04 to 0.10**	Low F/M ratio
Mean Cell Residence Time (MCRT), days	43	48	58	10-30**	high MCRT, high MLSS
Organic Loading, lbs/day-1,000ft^3	6.5	4.7	5.3	5-15**	-
Sludge Volume Index (SVI), ml/g	81			<100-150**	Good Settling
Mixed Liquor Color	Brown	Brown	-	Brown	
Microscopic Exam	Amoeboids, Flagellates, and Stalked Ciliates		-	-	Normal sludge

Note: **Operation of Wastewater Treatment Plants Vol 1 and 2, 7th Edition*, CSU,Sacramento, 2008.
***Wastewater Engineering: Treatment and Reuse* 4th edition, Metcalf& Eddy, 2003.

The permittee used MLSS concentration of 3,500 mg/l as the target concentration to waste sludge from the SBRs. The EPA MLSS value of 4,300 mg/l exceeded the POTW MLSS target by 18.6 percent. In addition the average MLSS for the month of March (4,937 mg/l) exceeded the POTW target by 29 percent. MLSS concentrations higher than the target operating parameter may affect the TSS and settleable solids removal efficiency. The MLSS concentration was still within the recommended target range but it was high based on the plant sludge waste targets.

Figure 2 describes the D.O. Profile conducted at the facility. The study was performed during the react cycle of the SBRs. Measurement intervals were recorded at twelve locations, on the surface, at one foot and three feet depths. The DO profile indicated good mixing on the surface, but not adequate D.O. under the surface.The DO profile revealed low DO concentrations in the two SBR tanks, ranging from 0.28 to 1.15 mg/l. These DO concentrations, especially at 1 ft and 3 ft depths, create an unfavorable environment for the for the growth and removal action of the aerobic and nitrifying bacteria.

Figure 3: ***Dissolved Oxygen (DO) Profile***



Note: a= Surface DO reading
b= 1ft depth DO reading
c= 3ft depth DO reading

The sludge age was 71 days, which exceeds the recommended range of 25 to 45 days (CSU, 2008). The F/M ratio of 0.03 lbs BOD/day/lbs-MLVSS was below the design range of 0.04 to 0.10 lbs BOD/day/lbs-MLVSS. The plant should increase sludge waste to provide a healthy food to microorganism ratio.

The food to microorganism ratio was 0.02 lbs BOD/day-lbs MLVSS, a value considered low. High MLVSS concentrations affect the F/M ratio. The same occurred with the USEPA MCRT of 43 days and the POTW MCRT for the month of March of 58 days. The MCRT operating parameter for an SBR system is 10 to 30 days. For optimal $CBOD_5$ removal, DO concentrations in the aeration basins should be maintained between 1.0 to 3.0 mg/l (Metcalf and Eddy, 2003). The permittee needs to assess the amount in cubic feet of air applied to the SBRs per pound of BOD removed (ft^3 air/BOD lbs removed). In addition, they need to determine the amount of air applied per gallon of wastewater treated. Typical air requirements parameters for a diffused aeration system range from 800 to 1500 ft^3/lbs BOD-removed (EPA).

5.3. SBR Biological Nutrient Removal (BNR)

The permittee exceeded the limits of the NPDES permit for ammonia-nitrogen every month of 2012, except November, 2012 (Table 3). The USEPA result for ammonia-nitrogen concentration was 0.37 mg/l (Table 7, page 17); a value below the NPDES permit limit of 1.1 mg/l. Nitrate-nitrite concentration at the influent was 0.30 mg/l and 9.1 mg/l at the effluent. The conversion of ammonia to nitrate requires significant amounts of oxygen, 4.6 mg of O_2 per 1 mg of nitrogen oxidized.

Analytical results showed that nitrification occurred in the SBRs at the time of the inspection, given that ammonia was oxidized from 14 mg/l to 0.37 mg/l (Table 7, page 17), and converted to nitrate-nitrite. Historical data showed that the Cornersville STP influent ammonia-nitrogen concentrations were generally higher than during the EPA evaluation. For example, the average ammonia-nitrogen concentrations for the month of November and December 2012 were 29.4 mg/l and 19.8 mg/l, respectively.

Low DO concentrations affect the biological nutrient removal efficiency. Maximum nitrification rates occur at DO concentrations greater than 2 mg/1. Also Temperature, pH, and solids retention time (SRT) are important parameters in nitrification kinetics. The optimum temperature for nitrification is between 25 and 35°C.

Operators applied manually sodium bicarbonate to add alkalinity to the SBR biomass to control the pH. Nitrification results in the consumption of alkalinity. As alkalinity is consumed, pH decreases. The plant average pH in the activated sludge is 7. Optimum pH for nitrification is in the range of 7.5 to 9.0. Below pH 7 and above pH 9.8 the nitrification rate is less than 50 percent of the optimum (EPA, 1992).

On 2012, the permitteee contracted J.R. Wauford Company Consulting Engineers to evaluate the plant problems to comply with the NPDES permit limits. The consultant concluded that alkalinity in the Cornersville Wastewater Treatment Plant is adequate to allow nitrification to occur at its maximum rate and the reported dissolved oxygen concentrations in the reactors are rarely greater than 1.0 mg/1. The permittee provided a copy of the consultant report.

Low DO concentrations in the activated sludge and the results of the settlometer test revealed that gentrification was occurring. The sludge initially settled during the 30-minute settling test and then floated to the surface after 1.5 hours. Denitrification was likely occurring in the SBR tank (Photo 9, page 32). Some probable causes of sludge rising:

- The activated sludge process is being operated at a low F/M ratio. Low F/M ratio was confirmed by the results of the operating parameters evaluation.
- The sludge has been held for too long in the SBRs and consequently all the available dissolved oxygen has been used by the microorganisms. At the time of the inspection, the facility sludge age was 71 days and the MCRT was 43 days (See Table 6).

The denitrification process in the SBRSs may possibly affect the $CBOD_5$, TSS and settleable solids effluent concentrations, thus resulting in violations of the limits of the NPDES Permit.

5.4. UV Disinfection System Evaluation

A UV vertical lamp disinfection system was observed at the Cornersville STP. UV system was operational but the UV lamps did not appear to be clean (slime growth observed) , and solids had accumulated in the channel. To disinfect the water, UV light must be intense enough to penetrate the cell walls of the pathogens. A dirty UV lamp has a reduced UV light density, thus affecting the efficiency of the UV system. UV disinfection with low-pressure lamps is not as effective for secondary effluent with TSS levels above 30 mg/l (USEPA, 1999). The permittee exceeded the limits of the NPDES permit for *E. coli* numerous times in 2012 and February, 2013. Appropriate weekly maintenance of the UV system is required. Additionally, it is extremely critical that proper SBR operation and process controls be implemented to provide for adequate TSS and settleable solids removal.

6. EFFLUENT AND RECEIVING WATERS

The final effluent was clear. There were no visible solids, oil sheens or foam observed in the final effluent streams (Photo 11, page 33) .

7. CONCLUSIONS

The Cornersville STP staff should focus on monitoring key operating parameters (MCRT, F/M, MLSS, sludge age) on a daily basis, interpret the data in relation to the effluent quality and sludge setteability, and conduct the necessary adjustments to meet the limits of the NPDES permit, specifically for $CBOD_5$, TSS, settleable solids, ammonia-nitrogen, and E. Coliform Bacteria. The solids inventory should be gradually reduced to obtain an MCRT that provides for adequate $CBOD_5$ removal and nitrification, as well as good settling characteristics. This will also bring the F/M ratio up, keeping the biological process more balanced and in an acceptable range of 0.4 to 0.10 lbs BOD/day-lbs MLVSS.

The SBRs diffuser system should be evaluated for performance and operation; including the blowers capacity to determine if the system has the capability to increase the air supply of the SBRs treatment processes. Higher DO levels are needed in the SBRs fill/react cycle (1 to 3 mg/l). The settlometer test showed a normal sludge setting but also showed that denitrification appears to be occurring at about 1.5 hours. To reduce the amount of gentrification that occurs during the decant cycle; the SBRs should be operated at the proper DO levels. .

The Cornersville STP should evaluate the alternative of increasing the SBR cycle time to approximately five hours (from 4.35 hours) to provide the required time for proper nitrification. The fill/react cycle time should be at least 3 hours (CSU, 2008). The optimal decant time may vary depending on sludge settlability, compaction, and denitrification.

The permittee should consider installing an automatic lime or sodium bicarbonate feeders and pH probe in the SBRs units to control pH fluctuations. The average pH for the plant's activated sludge was 7. Optimum pH for nitrification is in the range of 7.5 to 9.0.

A cleaning and maintenance schedule for the UV system would improve the disinfection process and better help the plant meet the NPDES permit limits for *E.coli*. SBR operation and process controls should be adjusted to provide for adequate TSS removal of 30 mg/l or less (monthly average) and settleable solids removal to enhance the disinfection efficiency of the UV system.

The City of Cornersville should recalibrate the effluent secondary flow meter to achieve accurate readings. The discharge channel upstream of the flume needs to be cleaned and properly maintained to meet program requirements.

The permittee should monitor the average influent flow of the plant to identify if the plant exceeds the 85 percent of the design criteria on an average annual basis based on the previous twelve months of data. If the 85 percent of design criteria is exceeded, the permittee should start the planning and provide a schedule of improvements to begin within one year of the exceeding the plant design, to expand the plant's capacity.

The influent automatic sampler should be moved upstream of the equalization basin and should be properly maintained. The intake line should be checked regularly for rags and other debris that can cause clogging problems. Or, the line should be moved or repositioned in a location where rags and debris are not a problem.

The City should consider the installation of a preliminary treatment process, such as a bar screen and a grit removal system, to reduce the inorganic solids in the equalization tank and subsequent units. Screening and grit removal in the plant influent will help minimize solids throughout the plant. The equalization tank should be evaluated for a potential accumulation of solids that could be reducing its capacity. The City should also assess the city's sewer system to detect potential infiltration problems that appear to increase the influent flow of the plant during raining events.

Transcription errors on the DMRs should be corrected and can be prevented with the development of an in-house quality assurance/quality control process. DMRs should be reviewed at least 2 to 3 times to avoid future errors.

Additional training or continuing education for public works staff should be provided to improve the operation of the plant and help the plant get back in compliance.

8. REFERENCES

1. "Operation of Wastewater Treatment Plants" Volume 1 and 2, Seventh Edition, California State University (CSU), Sacramento, 2008
2. Wastewater Technology Fact Sheet,"Sequencing Batch Reactors". Office of Water U.S.EPA 932-F-99-073, September, 1999.
3. Wastewater Technology Fact Sheet,"Ultraviolet Disinfection". Office of Water U.S.EPA 832-F-99-064, September, 1999.
4. "Sequencing Batch Reactors for Nitrification and Nutrient Removal". Office of Water U.S.EPA 832-R-92-002, September, 1992.
5. "Biological Nutrients Removal Processes and Costs". Office of Water U.S.EPA-823-R-07-002, June, 2007.
6. "Wastewater Engineering: Treatment and Reuse" 4th edition, Metcalf& Eddy, 2003. McGraw- Hill Companies, Inc. NY
7. "Activated Sludge Process Control Manual". USEPA SESD.
8. "Aerobic Biological Wastewater Treatment Facilities: Process Control Manual". Office of Water U.S.EPA III-A-524-77, March 1977.
9. "Field Manual for Performance Evaluation and Troubleshooting at Municipal Wastewater Treatment Facilities". Clean Water Consultants EPA contract-No. 68-01-4418, January, 1978.

ATTACHMENTS

Attachment 1: Photographic Log

PHOTOGRAPHIC LOG

Photo taken by: Jairo Castillo	Project Name: 13-0346-Cornersville STP

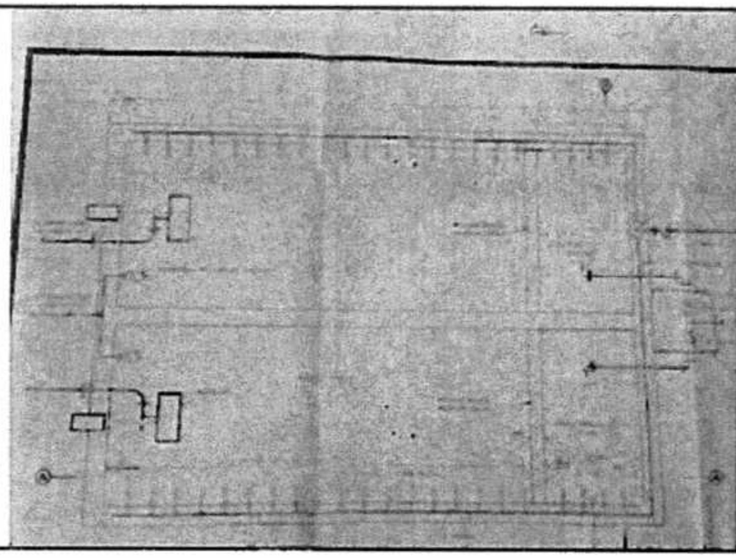
Photo No.	Date:
1	5/7/2013

Direction Photo Taken:

South

Description:

Facility blueprint- two Sequencing Batch Reactors



PHOTOGRAPHIC LOG

Photo taken by: Jairo Castillo	Project Name: 13-0346-Cornersville STP

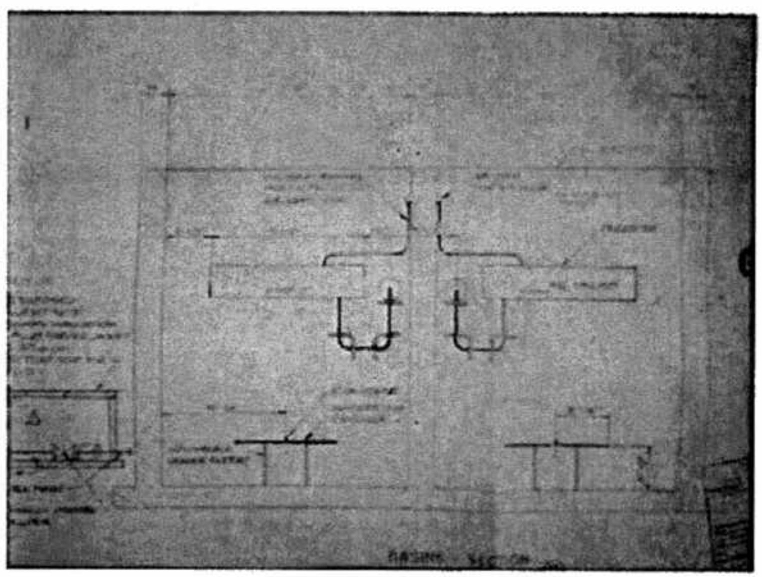
Photo No.	Date:
2	5/7/2013

Direction Photo Taken:

South

Description:

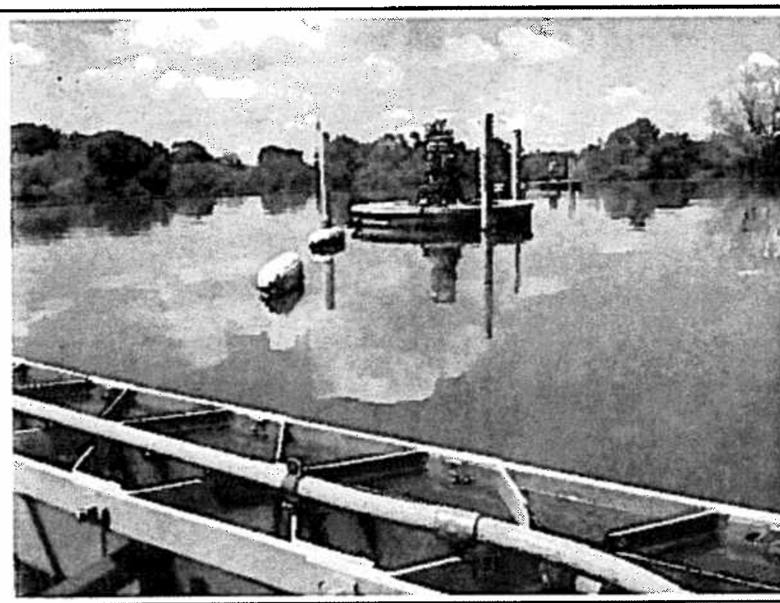
Facility blueprint- Section view of the two sequencing atch reactors.

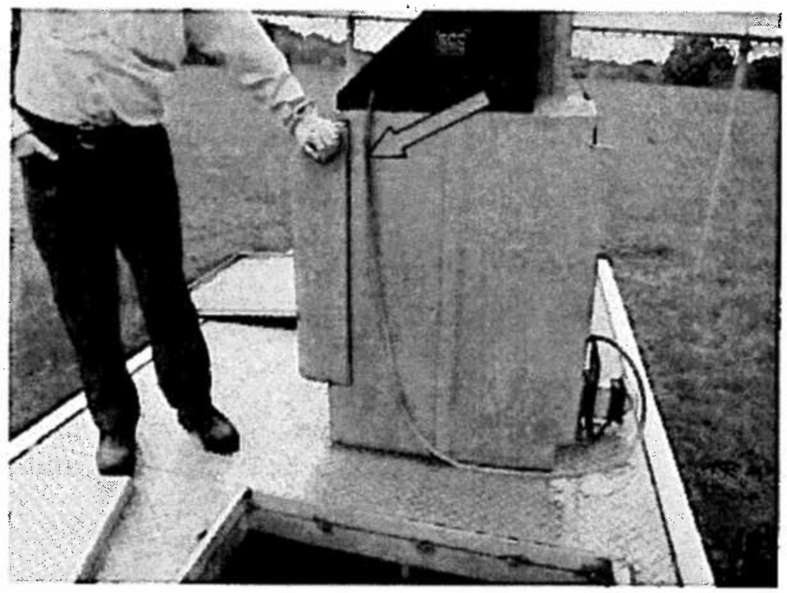


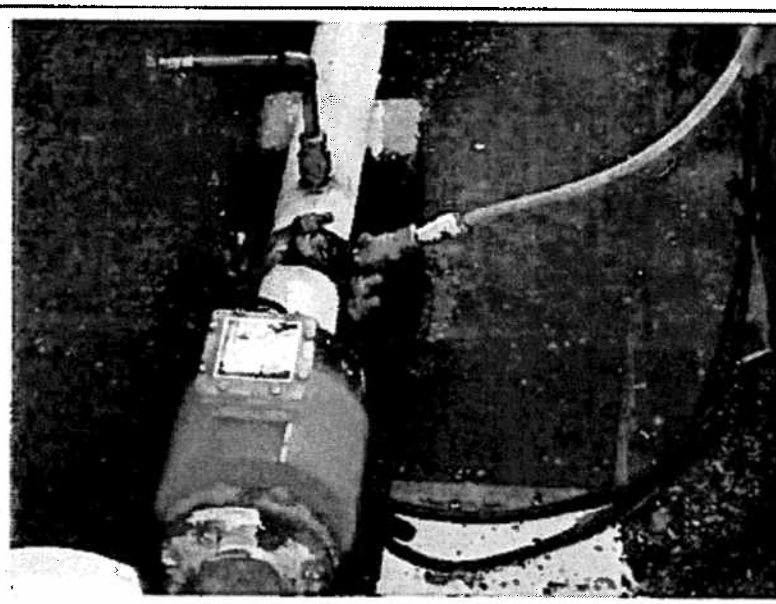
PHOTOGRAPHIC LOG

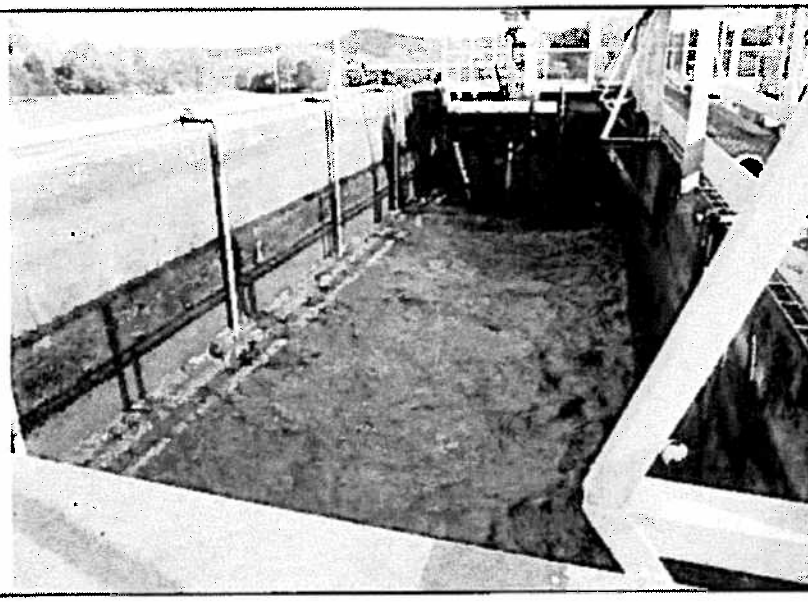
Photo taken by: Jairo Castillo		Project Name: 13-0346-Cornersville STP
Photo No. 3	Date: 5/7/2013	
Direction Photo Taken: East		
Description: Pump station located approximately 450 feet to the north of the WWTP. Previous location of influent composite sampler.		

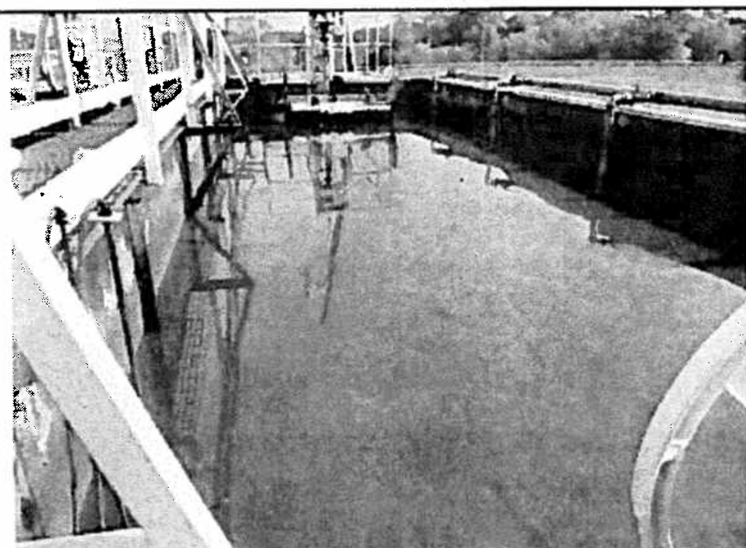
PHOTOGRAPHIC LOG

Photo taken by: Jairo Castillo		Project Name: 13-0346-Cornersville STP
Photo No. 4	Date: 5/7/2013	
Direction Photo Taken: West		
Description: Equalization tank was observed near exceeding capacity.		

PHOTOGRAPHIC LOG	
Photo taken by: Jairo Castillo	**Project Name:** 13-0346-Cornersville STP
Photo No. 5 — **Date:** 5/6/2013	
Direction Photo Taken: North	
Description: Influent sampler tubing clogged.	

PHOTOGRAPHIC LOG	
Photo taken by: Jairo Castillo	**Project Name:** 13-0346-Cornersville STP
Photo No. 6 — **Date:** 5/6/2013	
Direction Photo Taken: North	
Description: Influent sampler tubing connected to the influent pipe before the inline electromagnetic flow meter.	

PHOTOGRAPHIC LOG	
Photo taken by: **Jairo Castillo**	**Project Name:** **13-0346-Cornersville STP**
Photo No. 7 / **Date:** 5/7/2013	
Direction Photo Taken: South	
Description: SBR #2 during fill/mix cycle.	

PHOTOGRAPHIC LOG	
Photo taken by: **Jairo Castillo**	**Project Name:** **13-0346-Cornersville STP**
Photo No. 8 / **Date:** 5/7/2013	
Direction Photo Taken: South	
Description: SBR #1 during settling cycle	

PHOTOGRAPHIC LOG

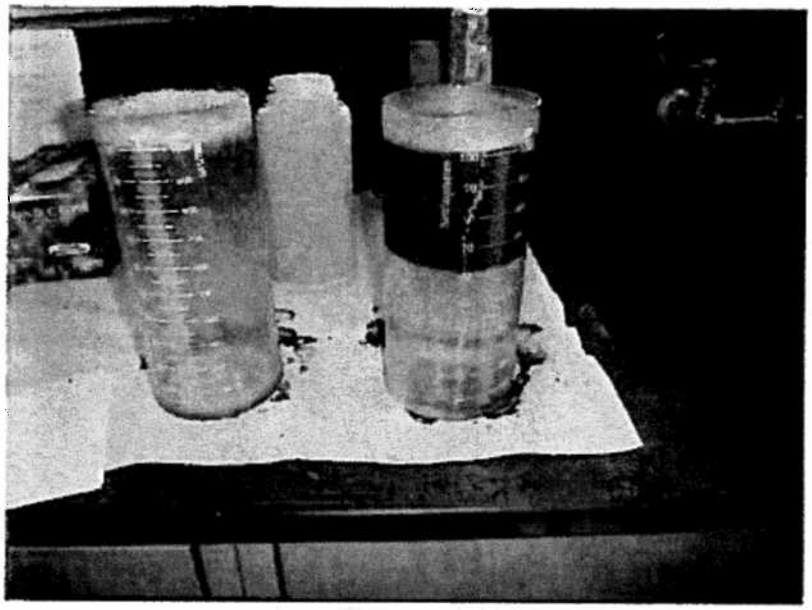
Photo taken by: Jairo Castillo	Project Name: 13-0346-Cornersville STP
Photo No. 9 / Date: 5/7/2013	

Direction Photo Taken:

South

Description:

Settlometer test after1.5 hours. Rising sludge is indicative of denitrification in the biomass.



PHOTOGRAPHIC LOG

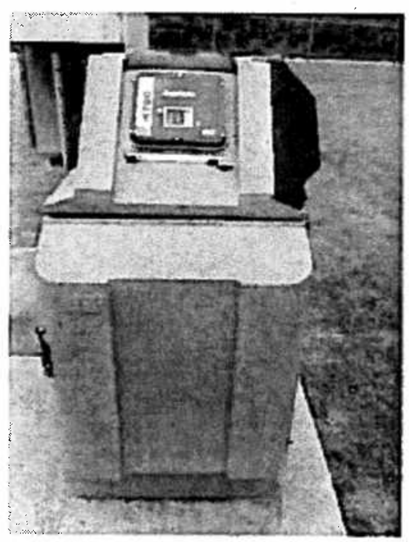
Photo taken by: Jairo Castillo	Project Name: 13-0346-Cornersville STP
Photo No. 10 / Date: 5/7/2013	

Direction Photo Taken:

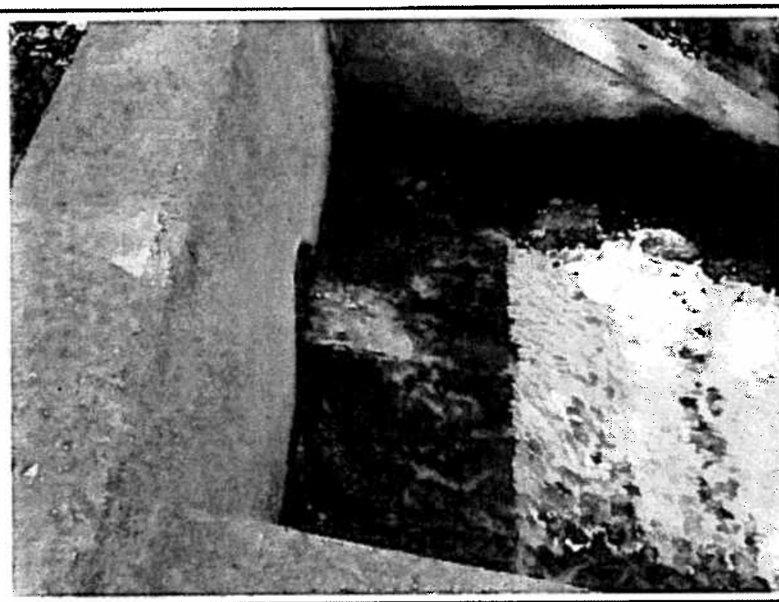
East

Description:

Effluent automatic sampler (ISCO 4700).



PHOTOGRAPHIC LOG

Photo taken by: **Jairo Castillo**	**Project Name:** **13-0346-Cornersville STP**
Photo No. 11 / **Date:** 5/7/2013 **Direction Photo Taken:** South **Description:** Cascade Aerator. Effluent appeared clear. No visible solids, oil sheens or foam observed in the final effluent streams.	

Attachment 2: Process Control Results: Settlometer Test and Microscopic Evaluation

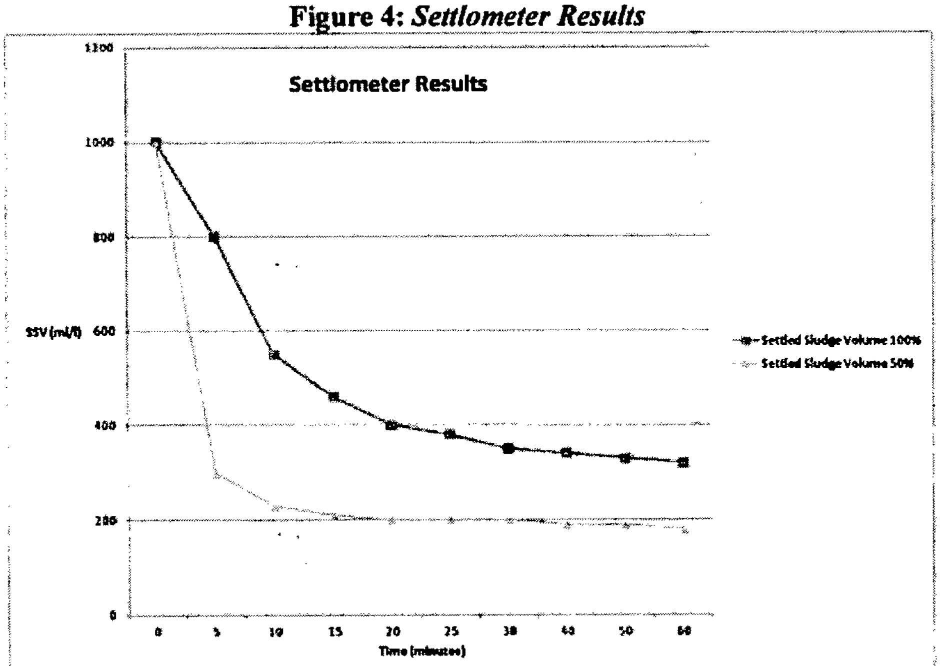
Settlometer Test

The settlometer test was performed to observe the settling characteristics of the mixed liquor, assess sludge quality and approximate age. A settlometer test was conducted at the plant using an undiluted 1,000 ml sample and a 50% diluted sample collected at the SBR during the react cycle (photo 9, page 31).

Table 10: ***Settlometer Test Results***

Time (minutes)	Settled Sludge Volume (ml/l) 100 percent MLSS	Settled Sludge Volume (ml/l) 50 percent MLSS
0	1000	1000
5	800	300
10	550	230
15	460	210
20	400	200
25	380	200
30	350	200
40	340	190
50	330	190
60	320	180

Figure 4: ***Settlometer Results***



Microscopic Examination

Table 11: ***Microscopic Examination Results***

Microorganisms	Quantity
Amoebae	10
Flagellates	10
Free swimming ciliates	4
Stalked ciliates	8
Rotifers	2
Worms	0
Nematodes	1

The predominance microorganisms were Amoeboids, Flagellates, and Stalked Ciliates. Free swimming ciliates were also observed in smaller quantities. Based on the microscopic examination, the sludge was normal.

Attachment 3: Operating Parameters Calculations

Cornersville STP Operating Parameters Calculations

USEPA calculated the operating parameters using three scenarios: USEPA diagnostic evaluation results, permittee's split sample results, and POTW March DMRs monthly average results for influent and Effluent $CBOD_5$ and TSS concentrations and MLSS Data for that month. March 2013 data was used to compare diagnostic evaluation data with the plant most recent data. MLSS and MLVSS concentrations were from SBR 1; calculations assumed that both tanks have the same concentrations (Historical data showed that there is a seven percent difference of MLSS concentrations between the SBRs). The following references were used for the calculations:

- *"Operation of Wastewater Treatment Plants" Volume 1 and 2, Seventh Edition*, California State University (CSU), Sacramento, 2008
- *"Wastewater Engineering: Treatment and Reuse" 4th edition*, Metcalf& Eddy, 2003. McGraw- Hill Companies, Inc. NY

EPA Data:
MLSS= 4,300 mg/l
BOD_5 influent= 40 mg/l
Influent Flow (Q^0)= 0.185 MGD
MLVSS plant average= 3,800 mg/l
Aeration basin volume= 0.070MG (2 tanks)
TSS_{inf}=20 mg/l
TSS_{eff}= 8.1 mg/l

POTW Data
V=0.070 MGD
$CBOD_5$ influent= 30.9 mg/l
Influent Flow (Q^0)= 0.170 MGD
Aeration basin volume= 0.070MG (2 tanks)
MLSS=4,300 mg/l (USEPA result used for calculations)
MLVSS=3800 mg/l (USEPA result used for calculations)
TSS_{inf}=22 mg/l
TSS_{eff}= 8.0 mg/l

POTW March average Data

$CBOD_5$ influent= 61.7 mg/l
Influent Flow (Q^0)= 0.098 MGD
Aeration basin volume= 0.070MG (2 tanks)
MLSS=4,937 mg/l
MLVSS=4,375 mg/l
TSS_{inf}= 69 mg/l
TSS_{eff}= 4.5 mg/l

Hydraulic Retention Time for the SBR system (Only calculated for USEPA)

USEPA Data:
SVI=81 ml/g
Mass of solids at full volume=Mass of settled solids
$VT*X=V_s*X_s$
V_t=Total volume, ft^3
X=MLSS Concentration at full volume, mg/l
V_s=settled volume after decant, ft^3
X_s= MLSS concentration in settled volume, mg/l
We need to solve the mass balance and determine the fill fraction/cycle.

a. Estimate X_s based on SVI value of 81 ml/g (measured onsite)

$$Xs = \frac{(10^3 \frac{mg}{g}) * (\frac{10^3 \, ml}{l})}{SVI, ml/g} = \frac{\left(10^3 \frac{mg}{g}\right) * (\frac{10^3 ml}{l})}{81 \frac{ml}{g}} = 12{,}346 \frac{mg}{l}$$

$X = 4{,}300 \frac{mg}{l}$ (from sampling)

b. Settled Fraction

$$\frac{V_s}{V_T} = \frac{X}{X_s} = \frac{4{,}300 \frac{mg}{l}}{12{,}346 \frac{mg}{l}} = 0.35$$

Provide 20 percent liquid above the sludge blanket so that solids are not removed by decanting mechanism (Metcalf and Eddy, 2004).

$$\frac{V_S}{V_T} = 1.2 * (0.35) = 0.42$$

c. Calculate fill fraction

$$V_F + V_S = V_T$$

Where V_F=fill volume, ft^3

$$\frac{V_F}{V_T} + \frac{V_S}{V_T} = 1.0$$

$\frac{V_F}{V_T} = 1.0 - 0.42 = 0.58$, using 0.5 as the fill fraction is acceptable.

d. Overall hydraulic detention time

Full liquid depth= 13ft
Decant depth= 0.5*(13ft)= 6.5 ft (Sludge judge measurements were 6-7 ft)

$$V_T = \frac{(4{,}719 \, ft^3)}{0.5} = 9{,}438 \frac{ft^3}{tank}$$

$$\text{Overall Hydraulic Detention Time} = \frac{2\text{ tanks} * (9{,}438\text{ ft}^3) * \left(24\frac{\text{hr}}{\text{d}}\right) * 7.48\text{ gal/ft}^3}{(185{,}000\frac{\text{gal}}{\text{d}})} = \mathbf{18\ hours}$$

The hydraulic detention time of 18 days is within the recommended of 15 to 40 hours (Metcalf and Eddy, 2003).

Sludge Volumetric Index (USEPA only)

Data:

Settled Volume=350 ml/g at 30 min in the Settlometer test

$$\text{SVI} = \frac{\left(\text{Settled volume of sludge, }\frac{\text{ml}}{\text{L}}\text{ in 30 min}\right)\left(\frac{10^3\text{mg}}{\text{g}}\right)}{\text{Suspended Solids, }\frac{\text{mg}}{\text{l}}}$$

$$\text{SVI} = \frac{\left(350\frac{\text{ml}}{\text{L}}\right)\left(10^3\frac{\text{mg}}{\text{l}}\right)}{4{,}300\frac{\text{mg}}{\text{l}}} = \mathbf{81}\frac{\mathbf{ml}}{\mathbf{g}}$$

A value of 100 ml/g is considered a good settling sludge, although SVI values below 100 are desired (Metcalf and Eddy, 2003).

Food-to-Microorganism Ratio (USEPA)

In equation form, the food-to-microorganism ratio is:

$$F/M_v = \frac{Q^0 S^0}{VX_v}$$

F/M_v= food to microorganism ratio in volatile basis, lb BOD or COD per day of volatile suspended solids in aeration tank

Q^0= Influent wastewater stream flow rate (MGD)

S^0= Influent wastewater BOD (or COD) concentration (mg/l)

V= aeration tank volume (MG)

X_V= volatile suspended solids concentration in aeration tank (mg/l)

Data

$CBOD_5$ influent= 40 mg/l

Influent Flow (Q^0)= 0.185 MGD

MLVSS plant average= 3,800 mg/l

Aeration basin volume= 0.070MG (2 tanks)

$$\frac{F}{M} = \frac{0.185\ \text{MGD} * 40\frac{\text{mg}}{\text{l}} * 8.34\frac{\text{lb}}{\text{gal}}}{0.070\ \text{MGD} * 3800\frac{\text{mg}}{\text{l}} * 8.34\frac{\text{lb}}{\text{gal}}} = \mathbf{0.03\ (low)}$$

A typical design parameter for an oxidation ditch activated sludge basin for the food-to- microorganism ratio (F/M) is 0.04-0.10 lb BOD/lb MLVSS-d (Metcalf and Eddy, 2003).

F/M Ratio (POTW)

Data

$CBOD_5$ influent= 30.9 mg/l

Influent Flow (Q^0)= 0.170 MGD

MLVSS plant average= 3,800 mg/l

Aeration basin volume= 0.070MG (2 tanks)

$$\frac{F}{M} = \frac{0.172\ \text{MGD} * 30.9\frac{\text{mg}}{\text{l}} * 8.34\frac{\text{lb}}{\text{gal}}}{0.070\ \text{MGD} * 3800\frac{\text{mg}}{\text{l}} * 8.34\frac{\text{lb}}{\text{gal}}} = \mathbf{0.02\ (low)}$$

POTW F/M ratio (March 2013 average)

$$\frac{F}{M} = \frac{0.098\ \text{MGD} * 61.7\frac{\text{mg}}{\text{l}} * 8.34\frac{\text{lb}}{\text{gal}}}{0.070\ \text{MGD} * 4375\frac{\text{mg}}{\text{l}} * 8.34\frac{\text{lb}}{\text{gal}}} = \mathbf{0.02\ (low)}$$

Organic Loading Rate (USEPA)

$$OLR, \frac{\text{lbs}}{\text{day} - 1000\text{ft}^3} = \frac{Q_{\text{in}}, \text{MGD} * \text{CBOD}_5, \frac{\text{mg}}{\text{l}} * 8.34 * 1000}{\text{Aeration Vol, ft}^3}$$

$$\text{OLR} = \frac{0.185\text{MGD} * 40\frac{\text{mg}}{\text{l}} * 8.34 * 1000}{9{,}438\text{ft}^3}$$

$$= \mathbf{6.5\frac{lbs}{day - 1,000ft^3}}$$

An organic loading rate of 6.5 lbs/day-1,000 ft^3 is within the recommended range of 5 to 15 lbs/day-1,000 ft^3

Organic Loading Rate (POTW)

$$OLR, \frac{\text{lbs}}{\text{day} - 1000\text{ft}^3} = \frac{Q_{\text{in}}, \text{MGD} * \text{CBOD}_5, \frac{\text{mg}}{\text{l}} * 8.34 * 1000}{\text{Aeration Vol, ft}^3}$$

$$\text{OLR} = \frac{0.172\text{MGD} * 30.9\frac{\text{mg}}{\text{l}} * 8.34 * 1000}{9{,}438\text{ft}^3}$$

$$= \mathbf{4.7\frac{lbs}{day - 1,000ft^3}}$$

Organic Loading (POTW March 2013 average)

$$OLR, \frac{\text{lbs}}{\text{day} - 1000\text{ft}^3} = \frac{Q_{\text{in}}, \text{MGD} * \text{CBOD}_5, \frac{\text{mg}}{\text{l}} * 8.34 * 1000}{\text{Aeration Vol, ft}^3}$$

$$\text{OLR} = \frac{0.098\text{MGD} * 61.7\frac{\text{mg}}{\text{l}} * 8.34 * 1000}{9{,}438\text{ft}^3}$$

$$= \mathbf{5.3\frac{lbs}{day - 1,000ft^3}}$$

Sludge Age (USEPA)

V=0.070 MG
MLSS= 4,300 mg/l
Q_{inf}= 0.185

$$\text{Sludge Age} = \frac{\text{Suspended Solids in Aerator, lbs}}{\text{Suspended Solids in Primary Effluent, }\frac{\text{lbs}}{\text{day}}}$$

$$\text{Sludge Age} = \frac{\text{MLSS, }\frac{\text{mg}}{\text{l}} * \text{Aerator Vol, MG} * 8.34\ \text{lbs/gal}}{\text{Prim Eff, }\frac{\text{mg}}{\text{l}} * \text{Flow, MGD} * 8.34\frac{\text{lbs}}{\text{gal}}}$$

$$\text{Sludge Age} = \frac{4{,}300\frac{\text{mg}}{\text{l}} * 0.070\text{MG} * 8.34\ \text{lbs/gal}}{20\frac{\text{mg}}{\text{l}} * .185\text{MGD} * 8.34\frac{\text{lbs}}{\text{gal}}} = \textbf{81 days (high)}$$

The sludge age of 81 days exceeds the recommended range of 25 to 45 days (CSU, 2008).

Sludge Age (POTW)

$$\text{Sludge Age} = \frac{4{,}300\frac{\text{mg}}{\text{l}} * 0.070\text{MG} * 8.34\ \text{lbs/gal}}{22\frac{\text{mg}}{\text{l}} * 0.172\text{MGD} * 8.34\frac{\text{lbs}}{\text{gal}}} = \textbf{80 days (high)}$$

Sludge Age (POTW, March 2013 average)

$$\text{Sludge Age} = \frac{4{,}937\frac{\text{mg}}{\text{l}} * 0.070\text{MG} * 8.34\ \text{lbs/gal}}{69\frac{\text{mg}}{\text{l}} * 0.098\text{MGD} * 8.34\frac{\text{lbs}}{\text{gal}}} = \textbf{51 days (high)}$$

Mean Cell Residence Time (MCRT) (USEPA)

SBR Volume= 0.070MG
MLSS= 4,300 mg/l
Wasted Sludge Flow= 0.0005 MGD
Waste Sludge Suspended Solids Concentration= 10,694 mg/l
TSS_{eff}= 8.1 mg/l

$$MCRT = \frac{\text{Suspended Solids (SS) in Aeration Systems, lbs}}{\text{SS Wasted,} \frac{\text{lbs}}{\text{day}} + \text{SS in Eff, lbs/day}}$$

$$\text{SS solids in Aerations Systems} = 4{,}300 \frac{\text{mg}}{\text{l}} * 0.070 \text{ MG} * 8.34 \frac{\text{lbs}}{\text{day}} = 2{,}510 \text{ lbs}$$

$$\text{SS Wasted,} \frac{\text{lbs}}{\text{day}} = 0.00052 \text{ MGD} * 10{,}694 \frac{\text{mg}}{\text{l}} * 8.34 \frac{\text{lbs}}{\text{gal}} = 46 \text{ lbs/day}$$

$$\text{SS in Eff,} \frac{\text{lbs}}{\text{day}} = 0.184\text{MGD} * 8.1 \frac{\text{mg}}{\text{l}} * 8.34 = 12.42 \text{ lbs/day}$$

$$MCRT = \frac{2{,}510 \text{ lbs}}{46 \frac{\text{lbs}}{\text{day}} + 12.4 \frac{\text{lbs}}{\text{day}}} = \mathbf{43 \text{ days (high)}}$$

The recommended design parameter for MCRT in oxidation ditch activated sludge is 15 to 30 days (Metcalf and Eddy, 2003).

MCRT (POTW)

$$MCRT = \frac{\text{Suspended Solids (SS) in Aeration Systems, lbs}}{\text{SS Wasted,} \frac{\text{lbs}}{\text{day}} + \text{SS in Eff, lbs/day}}$$

$$\text{SS solids in Aerations Systems} = 4{,}300 \frac{\text{mg}}{\text{l}} * 0.070 \text{ MG} * 8.34 \frac{\text{lbs}}{\text{day}} = 2510 \text{ lbs}$$

$$\text{SS Wasted,} \frac{\text{lbs}}{\text{day}} = 0.00052 \text{ MGD} * 10{,}694 \frac{\text{mg}}{\text{l}} * 8.34 \frac{\text{lbs}}{\text{gal}} = 46 \text{ lbs/day}$$

$$\text{SS in Eff,} \frac{\text{lbs}}{\text{day}} = 0.172\text{MGD} * 4.5 \frac{\text{mg}}{\text{l}} * 8.34 = 6.45 \text{ lbs/day}$$

$$MCRT = \frac{2{,}510 \text{ lbs}}{46 \frac{\text{lbs}}{\text{day}} + 6.45 \frac{\text{lbs}}{\text{day}}} = \mathbf{48 \text{ days (high)}}$$

MCRT (POTW, March 2013 average)

$$\text{MCRT} = \frac{\text{Suspended Solids (SS) in Aeration Systems, lbs}}{\text{SS Wasted}, \frac{\text{lbs}}{\text{day}} + \text{SS in Eff, lbs/day}}$$

$$\text{SS solids in Aerations Systems} = 4{,}937\,\frac{\text{mg}}{\text{l}} * 0.070\ \text{MG} * 8.34\,\frac{\text{lbs}}{\text{day}} = 2{,}882\ \text{lbs}$$

$$\text{SS Wasted}, \frac{\text{lbs}}{\text{day}} = 0.00052\ \text{MGD} * 10{,}694\,\frac{\text{mg}}{\text{l}} * 8.34\,\frac{\text{lbs}}{\text{gal}} = 46\ \text{lbs/day}$$

$$\text{SS in Eff}, \frac{\text{lbs}}{\text{day}} = 0.098\text{MGD} * 4.5\,\frac{\text{mg}}{\text{l}} * 8.34 = 3.7\ \text{lbs/day}$$

$$\text{MCRT} = \frac{2{,}882\ \text{lbs}}{46\frac{\text{lbs}}{\text{day}} + 3.7\frac{\text{lbs}}{\text{day}}} = \mathbf{58\ days\ (high)}$$

Attachment 4: Cornersville STP, TDEC and SESD Laboratory Results

CORNERSVILLE WASTEWATER PLANT
LAB TEST LOG# REPORT - 07-16-2013

CUSTOMER NAME : CORN - Tues

DATE	LOG NO.	QTY	TEST	RESULT
05-07-13	C13091	1	D. O. (Eff)	11.10
		1	Temperature	16.5
		1	S. S. (Eff)	0.1
		1	pH	7.64
		1	E. Coli	3.1
		1	BOD5 (Eff)	3.33
		1	BOD5 (Inf)	30.9
		1	TSS (Eff)	8.0
		1	TSS (Inf)	22.0
		1	AMMONIA (Eff)	0.1
		1	AMMONIA (Inf)	12.93

LEWISBURG WATER & WASTEWATER LAB
SAMPLE CHAIN OF CUSTODY

LOG NO. : C13091 SOURCE : CORN - Tues DATE SAMPLED : 05-07-13

SAMPLE NAME : D. O. (Eff) SIGNATURE NO. : 1, 2	SAMPLE NAME : Temperature SIGNATURE NO. : 1, 2
SAMPLE NAME : S. S. (Eff) SIGNATURE NO. : 1, 2	SAMPLE NAME : pH SIGNATURE NO. : 1, 2
SAMPLE NAME : E. Coli SIGNATURE NO. : 1	SAMPLE NAME : BOD5 (Eff) SIGNATURE NO. : 1
SAMPLE NAME : BOD5 (Inf) SIGNATURE NO. : 1	SAMPLE NAME : TSS (Eff) SIGNATURE NO. : 1, 2
SAMPLE NAME : TSS (Inf) SIGNATURE NO. : 1, 2	SAMPLE NAME : AMMONIA (Eff) SIGNATURE NO. : 1
SAMPLE NAME : AMMONIA (Inf) SIGNATURE NO. : 1	

ANALYST AND SAMPLER SIGNATURES :

1. SAMPLER D Maney
2. ANALYST D. Maney
3. ANALYST C Talley
4. ANALYST ____________

TENNESSEE
DEPARTMENT OF
HEALTH

DIVISION OF LABORATORY SERVICES

Jackson Regional Laboratory
295 Summar Drive
Jackson, TN 38301
731-426-0686

Shelby County Laboratory
814 Jefferson Avenue
Memphis, TN 38105
901-544-7555

Knoxville Regional Laboratory
2101 Medical Center Way
Knoxville, TN 37920
865-549-5201

Nashville Central Laboratory
630 Hart Lane
Nashville, TN 37243
615-262-6300

Sent To: Ryan Owens
TDEC-DWR
Columbia Field Office
1421 Hampshire Pike
Columbia, TN 38401

Lab ID: N00010401
Nashville Central Laboratory

Sampling Agency: TDEC: Division of Water Resources

J - Estimated value between MDL and MQL
MDL - Method Detection Limit
MQL - Method Quantitation Limit
U - Undetected

TDEC-DWR.N00010401.E

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Analytical Supervisor

Lab-Sample Number:	N00010401001	**Field Determinations**	
Project Name:		**pH:**	
Sample Description:	CORNERSVILLE STP	**Chlorine, residual:**	
		Conductivity:	
		Temperature:	
Sampler Project Name:	NPDES	**Dissolved Oxygen:**	
Project Site No.:	NOT GIVEN	**Other:**	
Station No.:		**Flow:**	CFS
Date/Time Collected:	05/07/2013 09:00		
Sampler's Name:	D. LOGSDON		
County:	MARSHALL - 59		
Sample Matrix:	Water		
EFO:	Columbia		
Sampling Agency:	TDEC-DWR		
Billing Code:	327.34-3082	**Agency Invoiced:**	TDEC-DWR
Send Report To:	TDEC-DWR		
Priority Date:			
Date/Time Received:	05/07/2013 12:15	**Received By:**	P Arjmandi

TEST: Escherichia Coli **METHOD:**
PERFORMING LAB: Nashville

ANALYTE	RESULT	UNITS	ANALYZED BY:	DATE
Method Citation	SM 9223B		V Jordan	5/7/2013
E. Coli Result	4.0	MPN/100ml	V Jordan	5/7/2013

State of Tennessee - Environmental Laboratories
PLEASE PRINT LEGIBLY

Inorganic Analysis

PROJECT/SITE NO.	PROJECT NAME NPDES
STATION NUMBER	COUNTY Marshall 59
DESCRIPTION Cornersville STP	
STREAM MILE	DEPTH / MATRIX WATER
COLLECTED: DATE 5-7-13	TIME 9AM
SAMPLER'S NAME(printed)	
SAMPLING AGENCY TDEC/WPC/CEFO	BILLING CODE 327.34-3082
IF PRIORITY, DATE NEEDED	
SEND REPORT TO: Ryan Owens	
CONTACT HAZARD	

*	Env. Microbiology	*	General Inorganics	*	Gen. Inorganics (con't)	*	Metals
	coliform, fecal*		acidity as $CaCO_3$*		oil and grease		aluminum, Al
	coliform, total*		alkalinity as $CaCO_3$*		orthophosphate, total*		antimony, Sb
	strep, fecal*		alkalinity, phen. as $CaCO_3$*		oxygen, dissolved*		arsenic, As
X	E. Coli*		BOD, 5-day*		pH		barium, Ba
	Enterococcus*		CBOD, 5-day*		phenols, total		beryllium, Be
			boron		phosphate, total		cadmium, Cd
*	Ambient Parameters		chloride*		residue, dissolved*		calcium, Ca
	COD*		chlorine, residual*		residue, settleable*		chromium, Cr
	coliform, fecal		chromium, hexavalent		residue, suspended*		cobalt, Co
	conductivity*		COD*		residue, total*		copper, Cu
	hardness, total as $CaCO_3$*		color, apparent*		silica*		iron, Fe
	nitrogen, ammonia		color, true*		sulfate*		lead, Pb
	nitrogen, NO_3 & NO_2		conductivity*		sulfide, total*		magnesium, Mg
	nitrogen, total Kjeldahl		cyanide		TOC*		manganese, Mn
	phosphate, total		flash point*		turbidity*		mercury, Hg
	pH		fluoride*		percent solids		nickel, Ni
	residue, dissolved*		hardness, Ca as $CaCO_3$*	*	Asbestos		potassium, K
	residue, suspended*		hardness, total as $CaCO_3$*		bulk asbestos		selenium, Se
	arsenic, As		hydrocarbons, total		other microscopic		silver, Ag
	cadmium, Cd		MBAS*				sodium, Na
	chromium, Cr		nitrogen, ammonia	*	Other		thallium, Tl
	copper, Cu		nitrogen, nitrate*				vanadium, V
	lead, Pb		nitrogen, nitrite*				zinc, Zn
	mercury, Hg		nitrogen, NO_3 & NO_2			*	TCLP
	nickel, Ni		nitrogen, total Kjeldahl				arsenic, As
	zinc, Zn		nitrogen, total organic				barium, Ba
							cadmium, Cd
							chromium, Cr
							lead, Pb
							mercury, Hg
							nickel, Ni
							selenium, Se
							silver, Ag

* denotes analyses performed only on water

FIELD DETERMINATIONS	Temperature
pH	Chlorine, residual
Conductivity	Other
Dissolved Oxygen	

For EPA

Laboratory Number N000 104 01
Branch Lab Number

Chain of Custody and Supplemental Information
Only one chain of custody form is required per sample set or point (if all collected at the same time)

1. Collected by D. Logsdon
Date 5-7-13 Time 9Am
Delivered to STATE Lab
Date 5-7-13 Time 12:45 pm
2. Received by
Date Time
Delivered to
Date Time
3. Received by
Date Time
Delivered to
Date Time
4. Received in Lab by [illegible]
Date 5/7/13 Time 1215
Logged in by
Date Time

Additional Information

1. Approximate volume of sample 250 ml
2. Nearest town or city Cornersville
3. Others present at collection John Williams, Jaieo Castillo Valenzuela, Bill Simpson } EPA
4. Number of other samples collected at same time at this point NONE
5. Field collection procedure, handling and/or preservation of this sample STATE SOP
6. Mode of transportation to lab locked STATE vehicle
7. Sample sealed by
8. Date sample sealed
9. Remarks

PH-3011 (rev 10/88)

RDA 1627

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

June 7, 2013

4SESD-ASB

MEMORANDUM

SUBJECT: FINAL Analytical Report
Project: 13-0346, Cornersville STP
Compliance Monitoring

FROM: Roberta Howes
ICS Chemist

THRU: Mike Wasko, Chief
ASB Inorganic Chemistry Section

TO: Jairo Castillo

Attached are the final results for the analytical groups listed below. These analyses were performed in accordance with the Analytical Support Branch's (ASB) Laboratory Operations and Quality Assurance Manual (ASB LOQAM) found at www.epa.gov/region4/sesd/asbsop. Any unique project data quality objectives specified in writing by the data requestor have also been incorporated into the data unless otherwise noted in the Report Narrative. Chemistry data have been verified based on the ASB LOQAM specifications and have been qualified by this laboratory if the applicable quality control criteria were not met. Verification is defined in Section 5.2 of the ASB LOQAM. For a listing of specific data qualifiers and explanations, please refer to the Data Qualifier Definitions included in this report. The reported results are accurate within the limits of the method(s) and are representative only of the samples as received by the laboratory.

Analyses Included in this report:	Method Used:	Accreditations:
Classical/Nutrient Analyses (CNA)		
Ammonia/TKN	EPA 350.1 (Water)	ISO
Ammonia/TKN	EPA 351.2 (Water)	ISO
Demand	SM 5210B (Water)	ISO
Nitrate and/or Nitrite	EPA 353.2 (Water)	ISO
Phosphorous	EPA 365.1 (Water)	ISO
Solids	SM 2540E (Water)	None
Solids	SM 2540F (Water)	None
Solids	USGS I-3765-85 (Water)	ISO

Sample Disposal Policy

Because of the laboratory's limited space for long term sample storage, our policy is to dispose of samples on a periodic schedule. Please note that within 60 days of this memo, the original samples and all sample extracts and/or sample digestates will be disposed of in accordance with applicable regulations. The 60-day sample disposal policy does not apply to criminal samples which are held until the laboratory is notified by the criminal investigators that case development and litigation are complete.

These samples may be held in the laboratory's custody for a longer period of time if you have a special project need. If you wish for the laboratory to hold samples beyond the 60-day period, please contact our Sample Control Coordinator by e-mail at R4SampleCustody@epa.gov, and provide a reason for holding samples beyond 60 days

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

SAMPLES INCLUDED IN THIS REPORT

Project: 13-0346, Cornersville STP

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
C050813-02	E131903-01	Wastewater	5/7/13 16:00	5/8/13 14:41
C050813-01	E131903-02	Wastewater	5/7/13 16:00	5/8/13 14:41
C050813-03	E131903-03	Wastewater	5/7/13 11:00	5/8/13 14:41

DATA QUALIFIER DEFINITIONS

U The analyte was not detected at or above the reporting limit.

A The analyte was analyzed in replicate. Reported value is an average value of the replicates.

ACRONYMS AND ABBREVIATIONS

CAS Chemical Abstracts Service

Note: Analytes with no known CAS identifiers have been assigned codes beginning with "E", the EPA ID as assigned by the EPA Substance Registry System (www.epa.gov/srs), or beginning with "R4-", a unique identifier assigned by the EPA Region 4 laboratory.

ISO The test, if analyzed after June 26, 2012, is accredited under the EPA Region 4 ASB's ISO/IEC 17025 accreditation issued by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1691.

MDL Method Detection Limit - The minimum concentration of a substance (an analyte) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero.

MRL Minimum Reporting Limit - Analyte concentration that corresponds to the lowest demonstrated level of acceptable quantitation. The MRL is sample-specific and accounts for preparation weights and volumes, dilutions, and moisture content of soil/sediments.

TIC Tentatively Identified Compound - An analyte identified based on a match with the instrument software's mass spectral library. A calibration standard has not been analyzed to confirm the compound's identification or the estimated concentration reported.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses

Project: 13-0346, Cornersville STP

Sample ID: C050813-02 **Lab ID:** E131903-01
Station ID: CEFF001 **Matrix:** Wastewater

Date Collected: 5/7/13 16:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
7664-41-7	Ammonia as N	0.37		mg/L	0.050	5/13/13 9:11	5/14/13 15:16	EPA 350.1
E17148461	Total Kjeldahl Nitrogen	1.4		mg/L	0.050	5/13/13 10:41	5/15/13 11:21	EPA 351.2
E1640614	BOD, 5-Day, Carbonaceous	5.3	A	mg/L	2.0	5/09/13 9:02	5/14/13 13:13	SM 5210B
E701177	Nitrate/Nitrite as N	9.1		mg/L	0.50	5/23/13 11:05	5/23/13 11:05	EPA 353.2
7723-14-0	Total Phosphorus	1.7		mg/L	1.0	5/14/13 14:09	5/14/13 18:26	EPA 365.1
E1642842	Settleable Solids	0.50	U	mL/L	0.50	5/09/13 11:15	5/09/13 12:00	SM 2540F
E1642818	Total Suspended Solids	8.1		mg/L	4.0	5/14/13 14:40	5/14/13 14:40	USGS I-3765-85

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses

Project: 13-0346, Cornersville STP

Sample ID: C050813-01 **Lab ID:** E131903-02
Station ID: CINF001 **Matrix:** Wastewater

Date Collected: 5/7/13 16:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
7664-41-7	Ammonia as N	14		mg/L	0.50	5/13/13 9:11	5/14/13 13:16	EPA 350.1
E17148461	Total Kjeldahl Nitrogen	14		mg/L	0.50	5/13/13 10:41	5/15/13 11:21	EPA 351.2
E1640614	BOD, 5 Day, Carbonaceous	40	A	mg/L	2.0	5/08/13 9:02	5/13/13 13:13	SM 5210B
E701177	Nitrate/Nitrite as N	0.30		mg/L	0.050	5/23/13 11:05	5/23/13 11:05	EPA 353.2
7723-14-0	Total Phosphorus	2.0		mg/L	1.0	5/12/13 14:09	5/14/13 10:26	EPA 365.1
E1642818	Total Suspended Solids	20		mg/L	4.0	5/14/13 14:40	5/14/13 14:40	USGS I-3765-85

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses

Project: 13-0346, Cornersville STP

Sample ID: C050813-03 **Lab ID:** E131903-03
Station ID: CSBR **Matrix:** Wastewater

Date Collected: 5/7/13 11:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642818	Total Suspended Solids	4300		mg/L	4.0	5/14/13 14:40	5/14/13 14:40	USGS I-3765-85
E1640374	Volatile Suspended Solids	3800		mg/L	4.0	5/14/13 14:40	5/14/13 14:40	SM 2540E

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses (CNA) - Quality Control

US-EPA, Region 4, SESD

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1304080 - C 350.1 Ammonia										
Blank (1304080-BLK1)				Prepared: 04/19/13 Analyzed: 05/14/13						
EPA 350.1										
Ammonia as N	U	0.050	mg/L							U
LCS (1304080-BS1)				Prepared: 04/19/13 Analyzed: 05/14/13						
EPA 350.1										
Ammonia as N	0.93400	0.050	mg/L	1.0000		93.4	90-110			
Matrix Spike (1304080-MS1)		Source: E131603-01		Prepared: 04/19/13 Analyzed: 05/14/13						
EPA 350.1										
Ammonia as N	2.0850	0.050	mg/L	1.0000	1.1420	94.3	90-110			
Matrix Spike Dup (1304080-MSD1)		Source: E131603-01		Prepared: 04/19/13 Analyzed: 05/14/13						
EPA 350.1										
Ammonia as N	2.1270	0.050	mg/L	1.0000	1.1420	98.5	90-110	1.99	10	
MRL Verification (1304080-PS1)				Prepared: 04/19/13 Analyzed: 05/14/13						
EPA 350.1										
Ammonia as N	0.052000	0.050	mg/L	0.050000		104	70-130			MRL-2
Batch 1305040 - C SM5210 BOD										
Blank (1305040-BLK1)				Prepared: 05/09/13 Analyzed: 05/14/13						
SM 5210B										
BOD, 5 Day, Carbonaceous	U	2.0	mg/L							U
LCS (1305040-BS1)				Prepared: 05/09/13 Analyzed: 05/14/13						
SM 5210B										
BOD, 5 Day, Carbonaceous	177.50	2.0	mg/L	164.00		108	81-119			
Duplicate (1305040-DUP1)		Source: E131903-01		Prepared: 05/09/13 Analyzed: 05/14/13						
SM 5210B										
BOD, 5 Day, Carbonaceous	4.4800	2.0	mg/L		5.3100			17.0	20	
Batch 1305043 - C 2540 Solids										
LCS (1305043-BS1)				Prepared & Analyzed: 05/09/13						
SM 2540F										
Settleable Solids	22.500	0.10	mL/L	23.000		97.8	90-110			

Classical/Nutrient Analyses (CNA) - Quality Control

US-EPA, Region 4, SESD

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1305043 - C 2540 Solids										
LCS (1305043-BS1)				Prepared & Analyzed: 05/09/13						
Duplicate (1305043-DUP1)		Source: E131903-01		Prepared & Analyzed: 05/09/13						
SM 2540F										
Settleable Solids	0.10000	0.10	mL/L		0.10000			0.00	10	
Batch 1305052 - C 351.2 TKN										
Blank (1305052-BLK1)				Prepared: 05/13/13 Analyzed: 05/15/13						
EPA 351.2										
Total Kjeldahl Nitrogen	U	0.050	mg/L							U
LCS (1305052-BS1)				Prepared: 05/13/13 Analyzed: 05/15/13						
EPA 351.2										
Total Kjeldahl Nitrogen	2.4418	0.050	mg/L	2.3400		104	90-110			
Matrix Spike (1305052-MS1)		Source: E131903-02		Prepared: 05/13/13 Analyzed: 05/15/13						
EPA 351.2										
Total Kjeldahl Nitrogen	17.773	0.50	mg/L	1.0000	13.859	391	90-110			XM-1
Matrix Spike Dup (1305052-MSD1)		Source: E131903-02		Prepared: 05/13/13 Analyzed: 05/15/13						
EPA 351.2										
Total Kjeldahl Nitrogen	18.014	0.50	mg/L	1.0000	13.859	416	90-110	1.35	20	XM-1
MRL Verification (1305052-PS1)				Prepared: 05/13/13 Analyzed: 05/15/13						
EPA 351.2										
Total Kjeldahl Nitrogen	0.072200	0.050	mg/L	0.050000		144	70-130			MRL-2, QR-2
Batch 1305060 - C 365.1 TPhos										
Blank (1305060-BLK1)				Prepared & Analyzed: 05/14/13						
EPA 365.1										
Total Phosphorus	U	0.010	mg/L							U

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Comersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses (CNA) - Quality Control

US-EPA, Region 4, SESD

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1305060 - C 365.1 TPhos										
LCS (1305060-BS1)				Prepared & Analyzed: 05/14/13						
EPA 365.1										
Total Phosphorus	0.37660	0.010	mg/L	0.40750		92.4	90-110			
Matrix Spike (1305060-MS1)	Source: E131903-02			Prepared & Analyzed: 05/14/13						
EPA 365.1										
Total Phosphorus	2.1700	1.0	mg/L	0.50000	1.9700	40.0	90-110			XM-1
Matrix Spike Dup (1305060-MSD1)	Source: E131903-02			Prepared & Analyzed: 05/14/13						
EPA 365.1										
Total Phosphorus	2.3400	1.0	mg/L	0.50000	1.9700	74.0	90-110	7.54	10	XM-1
MRL Verification (1305060-PS1)				Prepared & Analyzed: 05/14/13						
EPA 365.1										
Total Phosphorus	0.0079000	0.010	mg/L	0.010000		79.0	70-130			MRL-2, U
Batch 1305064 - C 2540 Solids										
Blank (1305064-BLK1)				Prepared & Analyzed: 05/14/13						
SM 2540E										
Volatile Suspended Solids	U	4.0	mg/L							B-3, U
USGS I-3765-85										
Total Suspended Solids	U	4.0	"							U
LCS (1305064-BS1)				Prepared & Analyzed: 05/14/13						
SM 2540E										
Volatile Suspended Solids	U	4.0	mg/L				90-110			NA, U
USGS I-3765-85										
Total Suspended Solids	93.100	4.0	"	100.00		93.1	90-110			
LCS Dup (1305064-BSD1)				Prepared & Analyzed: 05/14/13						
SM 2540E										
Volatile Suspended Solids	U	4.0	mg/L				90-110		200	NA, U
USGS I-3765-85										
Total Suspended Solids	92.000	4.0	"	100.00		92.0	90-110	1.19	10	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Comersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses (CNA) - Quality Control

US-EPA, Region 4, SESD

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1305064 - C 2540 Solids										
Duplicate (1305064-DUP1)		Source: E131903-03		Prepared & Analyzed: 05/14/13						
SM 2540E										
Volatile Suspended Solids	3780.0	4.0	mg/L		3800.0			0.528	10	
USGS I-3765-85										
Total Suspended Solids	4412.0	4.0	"		4320.0			2.11	10	
MRL Verification (1305064-PS1)				Prepared & Analyzed: 05/14/13						
SM 2540E										
Volatile Suspended Solids	U	4.0	mg/L				70-130			NA, U
USGS I-3765-85										
Total Suspended Solids	3.8000	4.0	"	5.0000		76.0	68-128			MRL-2, U
Batch 1305102 - C 353.2 NO3-NO2										
Blank (1305102-BLK1)				Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	U	0.050	mg/L							U
Blank (1305102-BLK2)				Prepared & Analyzed: 05/28/13						
EPA 353.2										
Nitrate/Nitrite as N	U	0.050	mg/L							U
Blank (1305102-BLK3)				Prepared & Analyzed: 05/29/13						
EPA 353.2										
Nitrate/Nitrite as N	U	0.050	mg/L							U
LCS (1305102-BS1)				Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	0.48980	0.050	mg/L	0.50000		98.0	90-110			
LCS (1305102-BS2)				Prepared & Analyzed: 05/28/13						
EPA 353.2										
Nitrate/Nitrite as N	0.51020	0.050	mg/L	0.50000		102	90-110			
LCS (1305102-BS3)				Prepared & Analyzed: 05/29/13						
EPA 353.2										

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Comersville STP - Reported by Roberta Howes

Classical/Nutrient Analyses (CNA) - Quality Control

US-EPA, Region 4, SESD

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1305102 - C 353.2 NO3-NO2										
LCS (1305102-BS3)				Prepared & Analyzed: 05/29/13						
Nitrate/Nitrite as N	0.49270	0.050	mg/L	0.50000		98.5	90-110			
Matrix Spike (1305102-MS1)		Source: E131808-09		Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	0.72860	0.050	mg/L	0.50000	0.22490	101	90-110			
Matrix Spike (1305102-MS2)		Source: E131903-02		Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	0.78820	0.050	mg/L	0.50000	0.29860	97.9	90-110			
Matrix Spike Dup (1305102-MSD1)		Source: E131808-09		Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	0.74690	0.050	mg/L	0.50000	0.22490	104	90-110	2.48	10	
Matrix Spike Dup (1305102-MSD2)		Source: E131903-02		Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	0.81670	0.050	mg/L	0.50000	0.29860	104	90-110	3.55	10	
MRL Verification (1305102-PS1)				Prepared & Analyzed: 05/23/13						
EPA 353.2										
Nitrate/Nitrite as N	0.039800	0.050	mg/L	0.050000		79.6	70-130			MRL-2, U
MRL Verification (1305102-PS2)				Prepared & Analyzed: 05/28/13						
EPA 353.2										
Nitrate/Nitrite as N	0.055200	0.050	mg/L	0.050000		110	70-130			MRL-2
MRL Verification (1305102-PS3)				Prepared & Analyzed: 05/29/13						
EPA 353.2										
Nitrate/Nitrite as N	0.036100	0.050	mg/L	0.050000		72.2	70-130			MRL-2, U

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 13-0346
Project: 13-0346, Cornersville STP - Reported by Roberta Howes

Notes and Definitions for QC Samples

U	The analyte was not detected at or above the reporting limit.
B-3	Level in blank does not impact data quality
MRL-2	MRL verification for Non-Potable Water matrix
NA	Not Analyzed.
QR-2	MRL verification recovery greater than upper control limits.
XM-1	Sample background/spike ratio higher than method evaluation criteria

Enclosure C

ENCLOSURE C

RIGHT TO ASSERT BUSINESS CONFIDENTIALITY CLAIMS
(40 C.F.R. Part 2)

Except for effluent data, you may, if you desire, assert a business confidentiality claim as to any or all of the information that the EPA is requesting from you. The EPA regulation relating to business confidentiality claims is found at 40 C.F.R. Part 2.

If you assert such a claim for the requested information, the EPA will only disclose the information to the extent and under the procedures set out in the cited regulations. If no business confidentiality claim accompanies the information, the EPA may make the information available to the public without any further notice to you.

40 C.F.R. § 2.203(b). Method and time of asserting business confidentiality claim. A business which is submitting information to the EPA may assert a business confidentiality claim covering the information by placing on (or attaching to) the information, at the time it is submitted to the EPA, a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as trade secret, proprietary, or company confidential. Allegedly confidential portions of otherwise non-confidential documents should be clearly identified by the business, and may be submitted separately to facilitate identification and handling by the EPA. If the business desires confidential treatment only until a certain date or until the occurrence of a certain event, the notice should so state.